# KOLPOHYSTERECTOMY FOR CANCER,

## WITH TABLES COMPARING ITS METHODS AND RESULTS.

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The recent announcement of but an 8 per cent. mortality in 24 consecutive cases by Fritsch,[1] of but a 9 per cent. mortality in 55 consecutive cases by Martin,[2] and of 16 cases by Staude,[3] without one death, has revived a somewhat abated interest in this operation. Sänger's[4] mortality of 28 per cent. obtained in 1883, had to the end of 1884 remained unaltered, notwithstanding the increased numbers of Mundé's,[5] Doche's,[6] and Duncan's[7] lists. The limits of success had been apparently reached, and the operation, even by its friends, abandoned to the opprobrium of an extraordinary death-rate. This opprobrium has been in a degree lifted. A brief history of the operation, the fact of a recently diminished mortality, with an analysis of its concomitants, and among them possibly its cause, will form the objects of this paper.

There is an imperative demand for improved methods of treating cancer. Its increased ravages are reported from a number of sides. In England and Wales from 1860–69 the deaths from cancer showed an annual increase of 248, while from 1870–79 they showed an annual increase of 320. Dr. Farr finds the English death-rate from cancer, 1873–74, 443 to each 1,000,000 inhabitants (*N. Y. Med. Record*, March 14, 1885, from figures of Register-General's Report). In New York, ten years ago, the deaths from cancer were but 400 to the 1,000,000 inhabitants, while, according to the latest returns, they are now 530 to the 1,000,000. Dr. A. R. Carter, of Baltimore, finds a great recent increase in the mortality from cancer in that city. While the population of Baltimore is but five times as great as it was thirty years ago, the deaths from cancer are now at the rate of 450 to the 1,000,000 inhabitants, or twenty-six times as frequent as at that period (*N. Y. Med. Record*, April 25, 1885).

Cancer is comparatively more frequent among women than among men. Simpson, of England, says that cancer is three times as frequent among women as among men.

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[1] Bokelmann, Arch. f. Gyn., 1884, p. 75. Heilbrun, Centralblatt f. Gyn., Jan. 31, 1885.

[2] Düvelius, Deutsche med. Wochenschr., Feb. 26, 1885.

[3] Schutz, Centralblatt f. Gyn., Feb. 7, 1885.

[4] Sänger, Arch. f. Gyn., 1883, xxi. 99.

[5] Mundé, Tr. Am. Gyn. Assoc., 1884.

[6] Doche, quoted by Gaz. Méd. de Paris, Feb. 14, 1885.

[7] Duncan, London Lancet, Jan. 31, 1885.

It is rare that reliable statistics regarding the relative frequency of the different varieties of cancer can be obtained, as the variety is seldom designated by physicians in their returns. Especially valuable, therefore, are the figures presented by the K.K. Krankenanstalt Rudolph Stiftings in Vienna, where, in 1882, there were treated 4451 men and 3159 women. Among this number there were 120 cases of malignant disease, of which 111 were cancers. Of the 120 cases, 25 were men and 95 were women, while of the cases among women, 57 were cancers of the uterus. In 1883 there were treated, in the same place, 5472 men and 3482 women, 115 being cases of malignant disease, and 104 cancers. Of the 115 cases, 27 were among men and 88 among women, 62 being cancers of the womb.

Hofmeier[1] reports that of 16,800 gynecological patients treated in Schröder's clinic, 603 suffered from cancer of the uterus, while of 9400, in Schröder's private practice, 209 had cancer of the uterus.

In rough numbers, therefore, it may be stated that the death-rate from cancer has increased during the last ten years; that three-fourths of all cancers are among women; that one-half of all cancers are cancers of the uterus; and that cancer of the uterus comprises, in Berlin, from one-fourth to one-third of all gynecological complaints.

This increased mortality, with the comparatively greater frequency of the disease among women, and its predilection for the uterine tissues, make extirpation of the uterus for cancer a subject of superior importance at the present time. While, however, some regard the recent successes of this operation as an enthusiastic promise for the future, others distrust their omen, remembering the history of the past.

Early Efforts at Extirpation of the Uterus for Cancer.—Andreas a Cruce,[2] in 1560, is supposed to have first performed this operation. He left a manuscript description, copies of which are to be found in the Berlin and Göttingen University libraries.

No further literature appears until the early part of the present century, when, in 1810, Joseph's Academy of Vienna offered a prize for an essay upon the subject. This movement was probably incited by the results of partial extirpation in the hands of Osiander, of Germany, and of Lisfranc, of France. The prize was awarded in 1814 to Gutberlet, who gave a complete set of rules for the operation, the abdominal section being made.

In 1825 Langenbeck the father operated according to Gutberlet's directions. The operation was repeated by Conrad Martin, of Germany, by Blundell, of England, and twice by Delpech, of France, who presented the subject before the French Academy. For Langenbeck's operation an assistant stood upon the right side of the patient to hold back the intestines from the excavation, and at the same time to compress the iliacs with the forefinger and thumb. A second assistant held in position a uterine sound, which was useful as a guide to the operator, and to render the neighboring tissues tense. A curved bistoury was carried upon the operator's forefinger so as to shield its cutting edge, and the parametria were divided as they were successively made tense. After all had been severed the uterus was lifted out, and a tampon soaked in a styptic solution was placed in the vagina, and the abdominal wound was closed. No other sutures, ligatures, or drainage were employed.

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[1] Zeitschr. f. Geb. u. Gyn., 1884.

[2] Kocks, Arch. f. Gyn., 1879, S. 127. Mikulicz, Berl. klin. Wochenschr., 1880, S. 1282. Kaltenbach, Op. Gyn., 1880, S. 409.

Delpech first loosened the vagina and separated the bladder from the cervix, the patient being in the position for stone. He afterward opened the abdomen in the linea alba, divided the remaining attachments of the uterus, and removed it. Both of Delpech's cases recovered, a vesicovaginal fistula being left in the second case. Langenbeck's case died.

In 1822 Sauter removed a cancerous uterus by the vagina; the patient recovered.

Langenbeck's name is also associated with the early history of the vaginal method. By some it is claimed that he originated it, as in 1813 he did a supravaginal amputation for cancer; and upon autopsy, thirty-one years later, the upper segment of the uterus was found to have been completely removed. Langenbeck did a total extirpation, according to Sauter, in 1825, Blundell in 1828, and Récamier in 1829. Langenbeck did this operation without medical assistance. Having a hemorrhage during its progress he was obliged to secure the bleeding vessel with one hand, while with the other hand, and with his lips, he adjusted the ligature. Langenbeck's case died. Récamier's case recovered from the operation, but died two months later of an intercurrent disease.

Of these early operators, Récamier only ligated the lower part of the broad ligament before division. Other operations were done without mass ligatures, and without closing the peritoneal wound. In spite of this absence of precautions the bleeding is reported to have been slight. As a rule, subsequent tying was not required.

Unsuccessful cases, however, followed. West[1] has collected 25 cases, of which 22 died. The *Gaz. des Hôp.* of those years describes scenes, horrible in the extreme, where, without anæsthesia, amid the screams and the writhings of the patient the uterus was literally torn away. Both methods were finally abandoned on account of their unfavorable results. No effort to revive them was made by that generation, and dust gathered upon their records, so that when, in 1878, Wm. A. Freund successfully removed the cancerous uterus, he was hailed as a discoverer and as a benefactor.

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[1] West, Diseases of Women, 1864, p. 300.

FREUND'S OPERATION.—Previous to the first operation of Freund, Dr. Emil Noeggerath,[1] of New York, made a somewhat similar effort. He loosened the cervix from the vagina, and then opened the abdomen and attempted to crush through the parametria with the écraseur, but without success. The uterus was left in the cavity, and a few days later the patient died.

Freund[2] operated mainly according to Gutberlet's directions, his distinguishing peculiarities being the previous ligation of the parametria in three portions before division and the complete closure of the pelvic peritoneal wound.

Freund's first operation was done January 30, 1878. A similar operation was done by Billroth[3] April 2, 1878, and by Kocks[4] April 28, 1878, independently and previous to Freund's publication. The earliest cases, as a rule, recovered, and further successful operations were done by Freund, Olshausen,[5] Martini,[6] Kocks, Spiegelberg,[7] and others.

An atmosphere of enthusiasm still lingers around the accounts of this period. A great future was anticipated for the operation; precedence in its history was eagerly sought; and, to secure to Freund the credit which was thought to be his due, Schröder proposed that it should be designated by his name.

The honor soon proved of doubtful value. Additional cases but added to the mortality list. Shock, hemorrhage, the wounding of neighboring organs, and septicæmia were encountered. The operation was very tedious. Three, four, and five hours were consumed in its performance. The third ligature was spoken of as "Zeitraubende." It was peculiarly difficult. Frequently the intestines could not be retained in the cavity, but had to be piled upon the abdomen, and the irritation and actual chill of their from one to three hours' exposure became a factor of importance in the unfortunate result.

The wounding of neighboring parts was not an accident only of the inexperienced. Billroth,[8] Massari,[9] Bardenheuer,[10] Czerny,[11] and Olshausen[12] wounded or included one ureter; Spiegelberg[13] and Œhlschläger[14] included both ureters at the same operation; while Reuss,[15] Spiegelberg,[16] and Bardenheuer wounded the bladder. Hemorrhage was always imminent. Freund himself acknowledged that his third ligature did not make the uterine artery secure. The mortality from septicæmia was great, and the original operation was variously modified.

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[1] Noeggerath, Am. Journ. Obst., 1877, p. 105.

[2] Freund, Volkmann's Sammlung, N. 133.

[3] Billroth; see Mikulicz, loc. cit.

[4] Kocks, loc. cit.

[5] Olshausen, Berl. klin. Wochenschr., 1881, p. 497.

[6] Martini; see Freund, Berl. klin. Wochenschr., 1878, p. 418.

[7] Spiegelberg, Bruntzel, Arch. f. Gyn., xiv. p. 245.

[8] Billroth, Wien. med. Wochenschr., 1880, p. 1310.

[9] Massari, Centralblatt f. Gyn., 1879, p. 257.

[10] Bardenheuer, Centralblatt f. Gyn., 1880, p. 140.

[11] Czerny, Wiener med. Wochenschr., 1879, p. 1227.

[12] Olshausen, Berl. klin. Wochenschr., 1881, p. 497.

[13] Spiegelberg, loc. cit., p. 264.

[14] Œhlschläger, Centralblatt f. Gyn., 1879, p. 203.

[15] Reuss, Arch. f. Gyn., xv. p. 139.

[16] Spiegelberg, loc. cit.

Kocks[1] separated the uterus from the bladder and rectum before laying the mass ligatures; also, after previous dilatation, he inserted a finger into the bladder to prevent its injury. Kocks reported three cases. Two recovered, one died. Credé[2] widened the field for operation by a partial resection of the anterior pelvic wall. For this purpose the horizontal rami of the pubes were divided so as to leave only a narrow rim of bone just above the clitoris, and about two weeks later the main operation was performed. The abdominal incision was carried to the clitoris by this means. Credé reported but one case, which died in collapse after the main operation. Massari[3] proposed to catheterize both the ureters and the bladder, to prevent wounding and inclusion. He reported but one case, which was unsuccessful. Bardenheuer[4] substituted an open wound with drainage for the closed pelvic peritoneal wound.

It should be especially noted that Bardenheuer, by this method, operated upon ten cases, of which nine recovered, a record which has but recently been surpassed. Breisky and Rydygier[5] incised the vagina and loosened the uterus from the bladder and rectum before making the abdominal incision after the method of Delpech. Kolaczek[6] omitted the peritoneal suture, and also the ligature *en masse*, as not only ineffectual in preventing hemorrhage, but also as likely to do injury to the nerve plexuses, which it would include. M. B. Freund,[7] a brother to the first operator, proposed previously to elevate the uterus with the colpeurynter, to loosen the cervix from the vagina previous to the abdominal incision, to omit mass ligatures and to divide all tissues with the galvanocautery knife.

In spite of all modifications, however, the mortality of the Freund operation remained excessive. Out of 93 cases collected by Kaltenbach, 53 died from its immediate effects, and, with the end of 1879, it ceased to be commonly performed, although in January of the present year Duncan[8] was able to cite 44 additional cases, the mortality remaining at 72 per cent.

Freund[9] himself, at the International Medical Congress, London, 1880, compared the results of his operation with those of the vaginal

[1] Kocks, loc. cit.

[2] Credé, Arch. f. Gyn., 1879, xiv. p. 430.

[3] Massari, Arch. f. Gyn., xv. p. 441.

[4] Centralblatt f. Chir., 1880, p. 140; Arch. f. Gyn., 1881, xviii. p. 465; Hegar and Kaltenbach's Op. Gyn., p. 408

[5] Rydygier, Berl. klin. Wochenschr., 1880, p. 642.

[6] Kolaczek, Centralblatt f. Chir., 1881, p. 129.

[7] M. B. Freund, Zeitschr. f. Geb. u. Gyn, vi. p. 358.

[8] Duncan, London Lancet, Jan. 31, 1885.

[9] Trans. Internat. Med. Congress, London, 1880, iv. p. 323.

method then coming into prominence, indicating the latter as the operation of the future.

Kolpohysterectomy for Cancer.—As Freund's first operation was antedated by that of Noeggerath, Czerny's operation also had a predecessor in the operation of Coudereau,[1] in 1875, and in the operation of Hennig,[2] who, in 1876, successfully removed the cancerous uterus from the vagina by shelling it out of its peritoneal envelope. July 25 Czerny, also, did a subperitoneal enucleation of the uterus for cancer. The patient recovered.

April 12, 1878, Czerny[3] performed the first operation, which, in its main details, represents the operation of to-day. Czerny published this case as a Sauter-Récamier operation. It was apparently done without reference to Freund's directions, as its difficulty was complained of, and the prospect of greater facility by the abdominal section was anticipated, the author subsequently doing two operations according to Freund. Both of these patients died, and Czerny returned to his original plan, but not until 1880, and after Billroth had operated by the vagina upon a number of cases. While, therefore, precedence in reviving the vaginal method belongs to Czerny, the credit for its introduction should be given to others.

Billroth[4] applied the principles laid down by Freund to the vaginal method, and did his first operation December 14, 1879. During 1880 Billroth operated upon six cases. Schröder[5] operated upon eight cases during the same period. The early and full descriptions furnished by Billroth and Schröder gave the first impulse to the movement.

Since Czerny's first operation, extirpation of the uterus by the vagina for cancer has been practised approximately 341 times, as shown in Table I.[6] of this paper, with a total mortality of 27 per cent.

Methods of Operation.—Czerny[7] drew the uterus firmly downward by hooks which penetrated the cervix or the adjacent tissues. The vagina was then separated from the cervix by a circular incision, the culs-de-sac were opened, and the uterus was everted through one or the other wound; anteverted or retroverted, as the fundus could be the more easily reached. The hooks removed from the cervix were made to engage the fundus in this manœuvre. The peritoneum was secured from retraction by passing through its border a thread of silk. The broad ligaments were then tied in three portions exactly as in Freund's operation, the uterus was liberated, and the ligatures were brought out into the vagina. In the majority of Czerny's cases the peritoneum was closed, and the supravaginal wound was united around a drain. In the first cases injections were used, but in the later cases these were replaced by tampons of iodoformized gauze.

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[1] La Tribune Med., 1875, p. 364.

[2] Hennig, Allg. Wein. med. Zeitung. n. 39, 1876.

[3] Czerny, Wien. med. Wochenschr., 1879, p. 197.

[4] Wien. med. Wochenschr., 1880, pp. 1281 *et seq.*

[5] Schröder, Zeitschr. f. Geb. u. Gyn., 1881, p. 226.

[6] Of the names of operators noticed in the other lists, those of MacCormac, Tansini, Guarnieri, Leisrink, Lane, Shepherd, and Lange are here omitted; MacCormac (Lancet, Jan. 14, 1882), Shepherd (Mich. Med. News, Feb. 10, 1879), and Lange (N. Y. Med. Record, April 1, 1882), because in each of their cases the abdominal section was made; Tansini and Guarnieri (l. c.), because the operations which they reported were done by Bottini; and Leisrink, because the result of his operation was not known. Lane (Pac. Med. and Surg. Journ., April, 1880) is omitted by mistake.

[7] Czerny, Wien. med. Wochenschr., 1879, p 1197.

Billroth[1] used the circular vaginal incision; employed mass ligatures, which he laid without inverting the uterus; and united the peritoneum around a drain. A second drain was placed in the supravaginal wound, and in some cases permanent irrigation was employed. In his later cases Billroth omitted both sutures and drain, employing the permanent tampon of iodoformized gauze.

Schröder[2] made the circular vaginal incision, drew the uterus down, loosened the cervix from the bladder and rectum, and opened the posterior cul-de-sac first. Then, passing a finger over the broad ligament, and using it as a director, he opened the anterior cul-de-sac. He retroverted the uterus. He tied the broad ligaments *en masse,* using first one ligature and afterward supplementing it by two. He tied one side and divided it before tying the other. He cut the mass ligatures short, and allowed them to escape into the abdominal cavity, or sewed them into the angles of the wound. He made no effort to unite the peritoneal edges, but used drainage, sewing up the supravaginal wound so as simply to embrace the tube.

Olshausen[3] used the circular vaginal incision. He laid a mass ligature upon each side before loosening the cervix. He used silk for his mass ligature, wire supplemented by silk, and subsequently the elastic ligature. He used drainage, both the peritoneal and supravaginal wounds being left open. In his last cases he used tampons of iodoformized gauze.

A. Martin[4] fixed the uterus *in situ.* He first opened Douglas's sac and then laid a mass ligature upon each side, so as to include the peritoneum and the posterior vaginal roof. He divided the attachments of the vagina above this ligature, and guided by his finger in Douglas's sac, he ligated and divided the lateral vaginal wall in the same manner. He retroverted the uterus by means of a sound, bringing it to the floor of Douglas's sac, where it was seized by a hook. He next ligated the remainder of the broad ligament, usually loosening the left side first. Then uniting the anterior peritoneal fold with the anterior vaginal wall, he divided it, and lastly ligated and divided the annexæ of the right side. He washed out Douglas's sac and left a drain in its cavity, closing the vagina with a salicylated tampon. Later the vagina was washed out with a two per cent. carbolic solution three or four times a day. The drainage tube was removed on the sixth or seventh day, and on the tenth day the patient left the bed.

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[1] Mikulicz, Wien. med. Wochen , 1880, p. 1281.

[2] Berl. klin. Wochen., Dec. 12, 1881, p. 742.

[3] Olshausen, Berl. klin. Wochenschr., 1881, p. 497.

[4] Martin, Berl. klin. Wochenschr., 1881, p. 261; Düvelius, Deutsch. med. Wochenschr., Feb. 26, 1885.

## TABLE I.

| Operator, and where reported. | No. of cases. | Date of operation. | Method of operation. | Patient's age and number of births. | Variety of growth. | Died. | Survived. | Disease returned. | No. reported well after operation. |
|---|---|---|---|---|---|---|---|---|---|
| Ahlfeld (Sänger), Arch. f. Gyn., 1883, I. 99. | 2 | ......... | ............................................ | ......... | ...... | 1 | 1 | | |
| Anderson, Amer. Journ. Obstet., April, 1882, p. 321. | 1 | ......... | Supravaginal amputation followed by sloughing and removal of fundus without opening peritoneum. Posterior wall of bladder implicated and excised, and vulva closed to complete its cavity. | ......... | Cervix. | ...... | 1 | | |
| Bardenheuer (Haidlen), Arch. f. Gyn., xix. I. 106. | 1 | ......... | ............................................ | ......... | ...... | 1 | ...... | | |
| Baum, Berl. klin. Wochen., 1880, p. 654. | 4 | ......... | Uterus not inverted; mass ligatures; no peritoneal sutures; drain into cavity; antiseptic tampon; injections when temperature rose. | ......... | ...... | 1 collapse 2 hours after operation.<br>1 septicæmia 15 days after operation. | 2 | | |
| Bernays, St. Louis Med. Journ., 1884, xlvi. 369; Kolpohysterectomy, Chip, vii, May 15, 1885. | 3 | ......... | Transfixes lateral vaginal wall, and paramet. depth 1 in.; tics, and divides next to the cervix; opens ant. cul-de-sac; anteverts uterus; mass ligatures for broad ligaments; no sutures; no drain; injections of plain water four times in twenty-four hours. | 52 years, 4 children. | Portio vaginalis. | ...... | 1, left bed 28th day. | ...... | Well end of 1½ years. |
| | ... | ......... | ............................................ | ......... | ...... | ...... | 2 | | |
| Billroth (Mikulicz), Wien. med. Wochenschr., 1880, p. 1281, and following; also Berl. klin. Wochenschr., Dec. 12, 1881, p. 742. | 12 | Dec. 1879 | Uterus not inverted; circular vaginal incision; mass ligatures; peritoneal sutures; drain into cavity; permanent irrigation. Duration of operation one hour. | 55 years, 5 children. | Portio vaginalis. | 1, peritonitis 7 days after operation. | | | |
| | ... | March 6, 1880. | ............................................ | 29 years, 2 children. | Cervix. | ...... | 1 | End 3 mos. | |
| | ... | April 18, 1880. | ............................................ | 36 years, mar'd, nullip. | Portio vaginalis. | ...... | 1 | Immediate. | |
| | ... | April 18, 1880. | ............................................ | 45 years, 4 children. | do. | 1, peritonitis | | | |
| | ... | July 24, 1880. | ............................................ | 37 years, 1 child. | do. | ...... | 1 | | |
| | ... | Aug. 12, 1880. | ............................................ | 42 years, 3 children. | Cervix. | 1, peritonitis 34 hrs. after operation. | | | |
| | ... | ......... | ............................................ | ......... | ...... | ...... | 1 | | |
| | ... | ......... | No sutures; iodoform; drain. | ......... | ...... | 1 | 2 | | |
| | ... | ......... | No sutures; no drain; tampon iodoformized gauze, undisturbed for one week. | ......... | ...... | ...... | 2 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Boeckel, Ann. de Gyn., Sept. 1884. | 1 | Oct. 26, 1883. | Vaginal incision ant. and post.; lateral vaginal walls included in mass ligatures. | 41 years, | ...... | ...... | 1, highest temp. 38°. | Died May 20, 1884. | |
| Bogoluboff, Abstd. Rev. des Sc. Méd., 1883, N. 42, p. 624. | 1 | ......... | ......................................... | ......... | ...... | ...... | 1 | | |
| Bolling, (Sänger, l. c.) | 1 | ......... | ......................................... | ......... | ...... | 1 | | | |
| Bompiani, Gaz. Med. di Roma, 1881, viii. 65. | 1 | ......... | Billroth's method. Duration of operation one hour. Hemorrhage. | 34 years, 2 children. | Cervix. | 1, shock 12 hours after operation. | | | |
| Bopp (Mundé), Tr. Am. Gyn. Assoc., 1884. | 3 | ......... | ......................................... | ......... | ...... | 2 | 1 | | |
| Bottini (Tansini), Gaz. Med. Ital. Lombard, April 16, 1881. | 5 | March 23, 1881. | Schröder's (?) method. Operation one hour. | 36 years, | ...... | ...... | 1, highest temp. 38°. | | |
| (Bizozzero), Abstd. C. f. C., 1882, p. 208 | | ......... | Schröder's method. Operation less than one hour. | ......... | ...... | ...... | 2 | ...... | 1, end of 6 months. |
| (Guarnieri), Gaz. degli Osp., Feb. 12, 1882. | | 1881. | Amputated cervix previous to operation; wounded bladder. | ......... | Body. | ...... | 1 | | |
| (Ciceri), Gaz. Med. Ital. Lombard., Feb 28, 1885. | | Jan. 9, 1885. | Operation 1½ hours. Profuse hemorrhage. | 42 years, 16 children. | Body and cervix. | ...... | 1, no fever. | | |
| Breisky, Prag. med. Wochenschr., 1883, p. 397. | 1 | July 7, 1883. | First stuffed cervix, iodoformized gauze; peritoneal suture; drain. | 60 years, 4 children. | ...... | ...... | 1 | | |
| Brendel, C. f. G, 1883, p. 697. | 1 | Aug. 25, 1882. | Circular vaginal incision opened ant. cul-de-sac, then post.; mass ligatures; peritoneal sutures; no drain; iodoform tampon changed third day; wounded bladder. | 40 years, 6 children. | Portio vaginalis. | ...... | 1, vesico-vag. fistula. | | |
| Bull, Phil. Med. News, April 5, 1884. (Mundé, l. c.) | 2 | Feb. 1883. | Mass ligatures; peritoneal sutures; no drain; iodoformized peat bags in vagina; changed 5th day. | 45 years. | do. | ...... | 1 | 1, 9th month after oper.; end 13 mos. no hem'rh., no disch'ge. | 1, 8 months. |
| | ... | ......... | ......................................... | ......... | ...... | 1 | | | |
| Burke, N. Y. Med. Rec., 1882, xxii. 644; | 2 | ......... | ......................................... | ......... | Cervix. | ...... | 1 | | |
| N. Y. Med. Journ., June 27, 1883, p. 103. | ... | ......... | ......................................... | 37 years. | do. | ...... | 1 | | |
| Calderini, Abstd. London, Lancet, March 17, 1883. | 1 | Jan. 16, 1883. | ......................................... | ......... | ...... | ...... | 1 | | |
| Caselli, Abst. in C. f. G., 1882, p. 80. | 1 | ......... | Uterus retroverted; peritoneal wound left open; no drain. | ......... | Body and cervix. | 1, peritonitis 11 days after operation. | | | |
| Cushing, Am. Journ. Med. Sci., 1882, p. 421. | 1 | Sept. 4, 1881. | Vaginal incision ant. and post.; lateral walls included in mass ligatures; uterus retroverted; previous wound left open; no drain; injections every two or three days. | 47 years, 1 child. | Portio vaginalis. | ...... | 1 | | |

TABLE I.—*Continued.*

| Operator, and where reported. | No. of cases. | Date of operation. | Method of operation. | Patient's age and number of births. | Variety of growth. | Died. | Survived. | Disease returned. | No. reported well after operation. |
|---|---|---|---|---|---|---|---|---|---|
| CZERNY, Wien. med. Wochen., 1879, 1197; Berl. klin. Wochen., Nov. 13, 1882. | 8 | July 25, 1878 | Langenbeck's subperitoneal enucleation; wounded peritoneum in three places. | 57 years, | ...... | ... .. | 1 | | |
| | ... | Aug. 12, 1878. | First modern operation according to the Sauter-Récamier method. Circular vaginal incision; opened ant. or post. cul-de-sac first, whichever reached the fundus most easily; secured the peritoneum from retraction by threads through its border; inverted uterus; used mass ligatures; united the peritoneum; united vaginal wound; drain; no injections; iodoform in last cases. Operation two hours. | 33 years, married. | ...... | ...... | 1, vesico-vag. fistula. | | |
| | ... | May 14, 1880. | Bladder wounded. Operation three hours. | 43 years, 7 children. | ...... | 1, septic peritonitis 40 hrs. after operation. | | | |
| | ... | Sept. 27, 1880. | Hemorrhage. | 46 years, 1 child. | ...... | 1, peritonitis 3d day. | | | |
| | ... | Dec. 18, 1880. | ........................................ | 44 years, 5 children. | Cervix. | ...... | 1 | 1 | |
| | ... | Jan. 1, 1881. | Operation three hours. Severe hemorrhage. | 61 years, 7 children. | Cervix. | 1, 3 days after oper. | | | |
| | ... | March 14, 1881. | 2 drains, 1 in each angle of wound. | 36 years, 10 children. | Portio vaginalis. | ...... | 1 | | |
| | ... | Oct. 7, 1881. | Operation two hours; hemorrhage; 60 ligatures used. | 47 years, 11 children. | Cervix. | ...... | 1 | 1 | |
| DEMONS, Arch. Gén. de Méd., 1883; Bull. et Mém. de la Soc. de Chir. de Paris, 1884, x. 577.<br>57 | 7 | Dec. 9, 1882. | Peritoneal wound left open; no drain; tampon iodoformized gauze. Operation $1\frac{1}{4}$ hours. | 30 years. | Cervix and body. | ...... | 1 | | |
| | | Jan. 6, 1883. | ........................................ | 34 years. | do. | ...... | 1 | ...... | 1, end of 18 months. |
| | ... | Feb. 22, 1883. | ........................................ | 35 years. | Cervix and lower part of body. | ...... | 1 | 1, end 9 mos. died 1 year after oper. | 1, 8 months. |
| | ... | April 14, 1883. | ........................................ | 26 years. | do. | 1, peritonitis 4 days after operation. | | | |
| | ... | June 18, 1883. | Sponge accidentally left in wound. | 42 years. | ...... | 1, peritonitis 3 days after operation. | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ... | 1883. | ........................................ | 62 years. | Entire uterus. | 1, peritonitis 4 days after operation. | | | |
| | ... | Feb. 28, 1884. | ........................................ | 41 years. | Cervix and inf. portion body. | ...... | 1 | | |
| Dudon (Demons), Arch. Gén. de Méd., 1883, vol. ii. p. 257. | 2 | ......... | ........................................ | ......... | ...... | 1 | | | |
| | | | Peritoneum closed; drain. | ......... | ...... | ...... | 1 | ...... | 1, end 2 years. |
| Duncan, Lond. Lancet, Jan. 31, 1885. | 2 | Jan. 22, 1884. | Schröder's method. | ......... | ...... | ...... | 1 | 1, died 10 months after operation. | |
| | ... | Feb. 26, 1885. | ........................................ | ......... | ...... | 1, collapse. | | | |
| Düvelius, Deutsch. med. Wochenschr., Feb. 26, 1885. | 4 | May 5, 1883. | Martin's method. Operation 2 hours. | 43 years; married. | ...... | ...... | 1, highest temp. 38.7°. | ...... | 1, 2 years after oper. |
| | ... | Aug. 28, 1883. | Operation 1½ hours. | 39 years. | Portio vag.; parametrium free. | ...... | 1, highest temp. 39°, 8th day. | 1, end 2 mos. died end 5 months. | |
| | ... | Feb. 19, 1884. | Operation 50 minutes. | 60 years. | Portio vag. and mass in right tube. | ...... | 1, highest temp. 39°, 9th day. | ...... | End 1 year. |
| | ... | Sept. 13, 1884. | ........................................ | 49 years; married. | Portio vaginalis. | ...... | 1, highest temp. 38.1°, 2d day. | ...... | 1, 5 mos. after oper. |
| Engström, Abst. in Rev. des Sc. Méd., 1884, p. 595. | 2 | ......... | Peritoneum left open; no drain. | 73 years. | Cervix. | 1 | | | |
| | ... | ......... | ........................................ | 65 years. | Cervix. | ...... | 1 | | |
| Esmarch, C. f. C., 1882, p. 71. | 2 | ......... | ........................................ | ......... | ...... | 1 | 1 | | |
| Fenger, Am. Journ. Med. Sc., 1882, p. 17. | 1 | Sept. 19, 1881. | Operation 2½ hours. Curetted diseased surface; opened both ant. and post. cul-de-sacs; circular vaginal incision; anteverted uterus; used mass ligatures; united the peritoneum; permanent irrigation of supravaginal wound. | 40 years, 9 children. | ...... | ...... | 1 | | |
| Foreman, Australian Med. Gaz., April 15, 1884, p. 143. | 1 | ......... | Martin's method. | 40 years, 8 children. | Cervix and lower part of body. | ...... | 1 | | |
| Fritsch, Die Krankheiten der Frauen, 1884, p. 314. (Bokelmann), Arch. f. Gyn., 1884, p. 75; (Heilbrun), C. f. G., Jan. 31, 1885. | 24 | June 25, 1883. | Curetted the diseased surface; first divides lateral vaginal walls and loosens the cervix from the parametrium, tying singly as cut; then opens ant. cul-de-sac, and unites peritoneum to vag. m. memb. by 3 or 4 sutures; anteverts the uterus, and ties the bd. ligs. in small portions, 6 or 7 each side, dividing them as tied; opens post. cul-de-sac last, and unites peritoneum to m. memb. vagina; leaves peritoneum open; no injections; no drain; dusts wound with iodoform; iodoformized tampon in vagina undisturbed 7–10 days. | 36 years, 2 children, 2 miscarriages. | Portio vag.; cauliflower excrescence size of apple. | ...... | 1, highest temp. 37.7°. | | |
| | ... | June 30, 1883. | ........................................ | 39 years, 7 children. | Portio vaginalis, body enlarged. | ...... | 1, highest temp. 38.8°. | | |

TABLE I.—*Continued.*

| Operator, and where reported. | No. of cases. | Date of operation. | Method of operation. | Patient's age and number of births. | Variety of growth. | Died. | Survived. | Disease returned. | No. reported well after operation. |
|---|---|---|---|---|---|---|---|---|---|
| FRITSCH, loc. cit. | .. | Oct. 1, 1883. | ...... | 44 years, 10 children. | Cervix, body enlarged. | 1, shock and septicæmia 3d day. | | | |
| | ... | Oct. 15, 1883. | ...... | 42 years, 3 children. | Portio vaginalis. | ...... | 1, highest temp. 39.1°. | | |
| | ... | Nov. 9, 1883. | ...... | 52 years, 12 children. | Cervix much ulcerated. | 1, 4th day occlusion of intestine and collapse. | | | |
| | ... | Nov. 27, 1883. | ...... | 34 years, 2 children, last 3 months, previously. | Portio vag. and post. vag. wall. | ...... | 1, highest temp 37.8°. | | |
| | ... | Dec. 1883. | ...... | 40 years, 6 children. | Cervix. | ...... | 1, highest temp. 38.2°. | | |
| | ... | Feb. 1884. | ...... | 44 years, 3 children. | Portio vaginalis. | ...... | 1 | | |
| | ... | Feb. 1, 1884. | ...... | 41 years, 6 children. | Cervix, uterus enlarg'd; parametri'm infiltrated. | ...... | 1, fistula of ureter. | | |
| | ... | March 6, 1884 | ...... | 33 years; married. | Portio vaginalis. | ...... | 1 | | |
| | ... | April, 1884. | ...... | 46 years, 7 children. | Cervix. | ...... | 1, thrombosis saphenous vein. | | |
| | ... | May 5, 1884. | ...... | 39 years, 7 children. | Portio vaginalis. | ...... | 1 | | |
| | ... | May 10, 1884. | Tampon removed first 12th day. | 77 years, 1 child. | do. | ...... | 1 | | |
| | ... | May 12, 1884. | ...... | 33 years, 3 children. | do. | ...... | 1 | | |
| | ... | July 17, 1884. | ...... | 54 years, 4 children. | do. | ...... | 1 | | |
| | ... | Aug. 6, 1884. | ...... | 37 years, 3 children. | do. no ulcerat'n. | ...... | 1 | | |
| | ... | Sept. 1, 1884. | ...... | 30 years, 4 children. | Portio vag. ulcerated; uterus not enlarged | ...... | 1 | | |
| | ... | Sept. 23, 1884. | ...... | 44 years, 2 children. | Portio vaginalis. | ...... | 1 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ... | Oct. 7, 1884. | ...................................... | 41 years, 4 children. | do. | ...... | 1 | |
| | ... | ......... | ...................................... | ......... | ...... | ...... | 5 | |
| Gardner (Hayward) Aus. Med. Gaz., May, 1885. | 1 | Dec. 11, 1884. | Mass ligatures; drain; peritoneum closed. | 50 years, 8 children. | ...... | 1 | | |
| Goodell, Am. Journ. Obst., April, 1884, p. 392. | 1 | ......... | Curette and Paquelin previous to operation; circular vaginal incision; retroverted uterus; mass ligatures; peritoneal wound united; sutures in supravaginal wound; dressing, cotton and iodoform. | ......... | ...... | 1, 4 days after operation. | ...... | |
| Giommi, Abst. in Phil. Med. News, May 16, 1885. | 1 | Feb. 19, 1885. | ...................................... | 36 years. | ...... | 1, 3 days after operation. | | |
| Hahn, Berl. klin. Wochen., 1882, p. 361. | 5 | Sept. 15, 1881. | Circular vaginal incision; mass ligatures; peritoneal wound left open; no drain; iodoform tampon, operation 1¼ hours. | 41 years, 2 children. | Portio vaginalis. | ...... | 1 | |
| | ... | Sept. 15, 1881. | ...................................... | 54 years, several child. | Portio vag.; left peramet. infiltrated. | 1, of consecutive bronchitis | | |
| | ... | Jan. 24, 1882. | ...................................... | 25 years, 3 children. | Portio vaginalis. | ...... | 1 | |
| | ... | Feb. 21, 1882. | ...................................... | 28 years; married. | Cervix. | ...... | 1 | |
| | ... | May 5, 1882. | ...................................... | 37 years, 4 children. | Portio vaginalis. | ...... | 1 | |
| Helferich, Abst. in Schmidt's Jahrbuch, N. 194, p. 152. | 1 | ......... | Bladder wounded; intestines prolapsed. | 58 years. | ...... | ...... | 1 | |
| Herff, Arch. f. Gyn., 1885, p. 315. | 1 | ......... | Fritsch's method, modified by wider lateral vaginal incision. | 49 years, 2 children. | ...... | ...... | 1, highest temp. 38.1°. 5th day. | |
| Holmer (Howitz, l. c.) | 1 | ......... | ...................................... | ......... | ...... | ...... | 1 | |
| Howitz, Abst. C. f. G., 1883, 438. | 2 | Sept. 20, 1882. | Vagina incised, ant. and post.; mass lig.; periton'm closed; drain; iodoform; wounded bladder; operation 4½ hours. | 57 years, 13 children. | Portio vaginalis. | ...... | 1 | |
| | ... | Oct. 12, 1882. | ...................................... | 41 years, 12 children. | Portio vag. rt. paramet. | ...... | 1 | |
| Johannovsky, Prag. med. Wochen., Nov. 14, 1883, p. 449. | 1 | Aug. 18, 1883. | Vagina incised, ant. and post.; uterus retroverted; mass ligatures; peritoneal wound left open; drain; iodoform. | 51 years, 8 children. | Cervix and body. | ...... | 1 | |
| Kocher, Abst. C. f. C., 1882, p. 164. | 1 | ......... | No sutures; no tube; antiseptic tampon and injections. | ......... | ...... | ...... | 1 | 1, end 3 w'ks after oper. |
| Kraussold, C. f. C., 1883, x. p. 17. | 2 | ......... | Uterus anteverted; mass ligatures; peritoneal wound left open; drain; vaginal tampon of iodoformized gauze. | 41 years; was a 2d wife; 1st wife also had uterine cancer. | ...... | ...... | 1 | |
| | ... | April 12, 1882. | ...................................... | 39 yrs., 3 child. many abort'ns; husb. syphil. | Portio vaginalis. | ...... | 1 | |

TABLE I.—*Continued.*

| Operator, and where reported. | No. of cases. | Date of operation. | Method of operation. | Patient's age and number of births. | Variety of growth. | Died. | Survived. | Disease returned. | No. reported well after operation. |
|---|---|---|---|---|---|---|---|---|---|
| KUFFERATH, Ann. de Gyn., July, 1884, p. 46. | 1 | Sept. 22, 1883. | ...... | 45 years, 2 children. | Cervix. | ...... | 1 | 1, 5 hours after oper. | |
| LEBEDEV, Index Medicus, Aug. 1885. | 2 | ...... | ...... | ...... | ...... | ...... | 2 | | |
| MARTIN,[1] A., Arch. f. Gyn., 1882, xx. 291; Path. u. Ther. der Frauenkheiten, 1885, p. 303. | 52 | Before 1882. | Curettes diseased surface previous to operation; cervix is strongly pulled toward the pubes to prevent prolapse of intestines; posterior cul-de-sac is opened first; uterus is not inverted; bottom of cul-de-sac is united to vagina before further division; ant. cul-de-sac is opened last; mass ligatures for broad ligaments; peritoneum not united; drain; tampon. | ...... | ...... | 8 | 23 | | |
| | ... | 1882–84. | ...... | ...... | ...... | 4 | 17 | | |
| MANDILLON (Demons), Arch. Gén. de Méd., 1883, ii. p. 267. | ... | ...... | Peritoneal sutures and drain. | ...... | ...... | ...... | 1 | | |
| MÜLLER, P., Wiener med. Wochen., Feb. 23, 1884, p. 214. | 4 | ...... | Vagina incised ant. and post.; lateral walls left intact until uterus retroverted; provisional mass ligatures each side over brd. ligs.; uterus divided vertically before removal; no peritoneal sutures; no drain; sublimate injections two or three times daily; carbolized tampon. | ...... | ...... | ...... | 4 | | |
| MUNDÉ, Trans. Am. Gyn. Assoc., 1884; N. Y. Med. Journ., July 25, 1885. | 3 | Oct. 10, 1883. | United peritoneum by stitches, including supravaginal wound; drain. | ...... | ...... | ...... | 1, drain removed 7th day. | 1, end of 1 year. | |
| | ... | Nov 9, 1883. | Schröder's method; hemorrhage from post. vaginal wall concealed by speculum. | ...... | ...... | 1, 4 hours after oper'n shock and hemorrh'ge. | | | |
| | ... | ...... | ...... | ...... | ...... | 1 | | | |
| NOEGGERATH, (Mundé, l. c.) | 3 | ...... | ...... | ...... | ...... | 3 | | | |
| NOVARO (Caponotes), Abst. C. f. G., April, 1885. | 20 | ...... | ...... | ...... | ...... | 10 | 10 | | |
| OLSHAUSEN, Ber. klin. Wochen., 1881, p. 497; Arch. f. Gyn., 1882, p. 291; Beiträge zur Gyn., 1884, p. 107. | 32 | April 2, 1881. | Circular vaginal incision; mass ligatures, silk, wire, or elastic; no peritoneal sutures, but always drainage tube into peritoneal cavity. | 61 years; married; nullip. | Body. | ...... | 1 | | |
| | | April 11, 1881. | Operation two hours. | 45 years, 5 children. | Portio vaginalis. | ...... | 1 | | |
| | | May 28, 1881. | Collapse during operation; rallied with difficulty. | 48 years, 1 child. | Cervix. | ...... | 1 | | |

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[1] Düvelius's statement of 55 cases, with 5 deaths, is here omitted because the point from which it overlaps the older reports is not apparent.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ... | June 13, 1881. | Hemorrhage during operation. | 36 years, 10 children. | do. | ...... | 1 | | |
| | ... | June 27, 1881. | Prolapse of intestines; collapse during operation. | 39 years, 1 child. | Portio vaginalis. | ...... | 1 | | |
| | ... | July 29, 1881. | Collapse during operation. | 34 years; married. | do. | ...... | 1 | | |
| | ... | ......... | ........................................ | ......... | ...... | 6 | 11 | 1, died 15 months after operation. | |
| | ... | ......... | ........................................ | ......... | ...... | 1 | 8 | 1, died 17 months after oper. 1. | |
| **Paggi**, Lo Sperimentale, 1882, ii. 487. | 1 | Sept. 18, 1882. | Billroth's method. | 45 years. | Portio vaginalis. | 1, 32 hours after oper. | | | |
| **Peruzzi**, Gaz. degli Osp., May 7, 1884. | 1 | March 8, 1884. | ........................................ | 34 years. | Cervix. | ...... | 1 | | |
| **Pawlik**, Wien. klin., 1882, p. 403. | 1 | April 1, 1880. | Uterus retroverted; mass ligatures; open peritoneal wound; drain; cancerous mass not all removed. | 35 years, 8 children. | Cervix, cys. brd. ligam't infiltrated. | .... . | 1 | 1, 5 mos. aft'r oper.; died 9 months after operation. | |
| **Purcell**, London Lancet, Jan. 31, 1885. | 1 | Sept. 23, 1884. | No peritoneal sutures; drain. | ......... | ...... | ...... | 1, highest temp. 101.4° | | |
| **Sänger**, (Sänger, Leipzig, l. c.) | 2 | ......... | ........................................ | ......... | ...... | 1 | 1 | | |
| **Sänger** (Leipzig), Arch. f. Gyn., 1883, xxi. 99. | 2 | Oct. 18, 1881. | Circular vaginal incision; uterus retroverted; mass ligatures; peritoneum closed; iodoform; no drain; hemorrhage during operation. | 56 years, 5 children. | Cervix. | ...... | 1 | 1, died 10 mos. after operation. | |
| | ... | ......... | ........................................ | 36 years. | do. | ...... | 1 | | |
| **Schatz**, Arch. f. Gyn., 1883, xxi. III. 409. | 10 | Feb. 26, 1881. | First opened Douglas's sac and then united the bottom of cul-de-sac to vagina by a peculiar "kettennaht;" retroverted uterus; tied and divided bd. ligs. in short sections; divided peritoneum ant. cul-de-sac last; left peritoneal cavity open. Patient occupied half sitting posture in kind of chair. No drain; no injections. | 55 years, 6 children. | Body. | ...... | 1 | ...... | 1, end of 1½ years. |
| | ... | March 11, 1881. | ........................................ | 24 years, 3 children. | ...... | ...... | 1 | 1, died 31 weeks after operation. | |
| | ... | Aug. 24, 1881. | ........................................ | 48 years, 2 children. | ...... | ...... | 1 | | |
| | ... | Sept. 21, 1882. | ........................................ | 55 years, 7 children. | Cervix. | ...... | 1 | | |
| | ... | Sept. 26, 1882. | ........................................ | 44 years, mrd., nullip. | Body (much enlarged). | ...... | 1 | | |
| | ... | Sept. 30, 1882. | ........................................ | 54 years, 1 child. | Body and cervix. | ...... | 1 | 1, 6 months after oper. | |
| | ... | Dec. 29, 1882. | ........................................ | 53 years, 8 children. | Body. | 1, peritonitis 4th day. | | | |
| | ... | ......... | Included ureters. | 52 years, 2 children. | Cervix. | 1, 7th day. | | | |

TABLE I.—*Continued.*

| Operator, and where reported. | No. of cases. | Date of operation | Method of operation. | Patient's age and number of births. | Variety of growth. | Died. | Survived. | Disease returned. | No. reported well after operation. |
|---|---|---|---|---|---|---|---|---|---|
| SCHATZ, loc. cit. | ... | ......... | ............................................ | 52 years, 2 children. | Body. | ...... | 1 | | |
| | ... | ......... | ............................................ | 42 years, 4 children. | Portio vaginalis. | 1, 3 hours after oper. | ...... | | |
| SCHEDE, Berl. klin. Wochen., 1880, p.318. | 2 | ......... | Billroth's method. | ......... | ...... | 1, lived 4 dys<br>1, 2d day. | | | |
| SCHRÖDER, Zeitschr. f. Geb. u. Gyn., 1881, p. 226; Br. Med Journ., Sept. 15,1883; (Hofmeier) Zeitschr. f. Geb. u. Gyn., 1884, | 34 | May 17, 1880. | Retroverted uterus; mass ligatures; no peritoneal sutures, but vaginal wound united around drain. | ......... | Cervix. | ...... | 1 | | |
| | ... | May 19, 1880. | ............................................ | ......... | do. | ...... | 1 | | |
| | ... | May 20, | ............................................ | ......... | do. | ...... | 1 | | |
| | ... | July 1, | ............................................ | ......... | do. | ...... | 1 | | |
| | ... | July 26, | ............................................ | ......... | do. | ...... | 1 | | |
| | ... | July 30, | ............................................ | ......... | do. | 1, 3 hours after oper. | | | |
| | ... | Dec. 6, | ............................................ | ......... | ...... | ...... | 1 | | |
| | ... | Aug. 29, | ............................................ | ......... | ...... | ...... | 1 | | |
| | ... | ......... | ............................................ | ......... | ...... | 6 | 14 | ...... | 2, end of 2 years; 2, end 1 year. |
| | ... | ......... | ............................................ | ......... | ...... | 2 | 4 | | |
| SIMPSON, Edinb. Med. Journ., 1882–3, p. 425. | 1 | May 23, 1882. | Used cautery knife; divided uterus vertically, according to method of Müller; secondary hemorrhage. Does not consider the cautery safe as ligatures and knife. | 39 years, 6 children. | ...... | 1, collapse. | | | |
| SOLOVIEFF, Abstd. Rev. des Sc. Méd., 1883, N. 42, p. 624. | 1 | ......... | Billroth's method. | 53 years. | ...... | ...... | 1 | | |
| SOLOVIEFF, Abst. in C. f. G., 1882, p. 607. | 1 | ......... | Schröder's method. | 33 years. | Cervix. | ...... | 1 | | |
| STARCK, Berl. klin. Wochen., March 20, 1882. | 1 | Aug. 2, 1881. | No mass ligatures; no sutures; no drain; vagina filled with Lister's gauze; ureter was implicated; the diseased part was excised; central extremity tied, and one week later extirpation of the kidney was performed. | 42 years, 7 children. | Portio vag., parametri'm invaded. | ...... | 1 | | |
| STAUDE, Deutsch. med. Wochen., 1883, p. 659; (Schütz) C.f. G., Feb. 7, 1885. | 16 | June, 1882. | Thorough disinfection; circular vaginal incision; uterus retroverted; mass ligatures; ant. cul-de-sac divided last; stumps sunken; peritoneum united, and supravaginal wound sewed up around drain; iodoform. | ......... | Cervix and body. | ...... | 1 | 1, end 1 yr. | |
| | ... | ......... | ............................................ | 33 years. | Cervix. | ...... | 1 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ... | ........ | ........................................ | ........ | do. | ...... | 2 | 1<br>months. | |
| | ... | ........ | Peritoneal suture difficult; collapse during operation. | ........ | Portio and cervix. | ...... | 1 | 1, end 12 weeks. | |
| | ... | Jan. 1881. | ........................................ | 46 years, 3 children. | Cervix and body. | ...... | 1, highest temp. 38.5°. | 1, end 1½ years. | |
| | ... | Nov. 1880. | Operation three hours, difficult; left ureter involved in disease, and excised. | 50 years. | Cervix. | ...... | Died 1½ yr. later general prostration; no local return. | | |
| | ... | ........ | ........................................ | ........ | ...... | ...... | 10 | | |
| Stewart, Trans Ill State Med Soc, xxii. 1883, p. 192. | 1 | ........ | ........................................ | 35 years, 4 children. | ...... | ...... | 1 | | |
| Studsgaard (Howitz, l. c). | 1 | ........ | ........................................ | ........ | ...... | ...... | 1 | | |
| (Not designated Howitz, l. c,) | 2 | ........ | ........................................ | ........ | ...... | 2 | | | |
| Tauffer, Arch. f. Gyn, 1884, xxiii. p. 367. | 5 | Oct. 2, 1881. | Previous use curette or clamp to diseased part; uterus retroverted; peritoneum secured from retraction by silk thread; peritoneum closed; vaginal wound united around drain. | 30 years, 9 children. | Cervix. | 1, 3d day septicæmia. | | | |
| | ... | June 22, 1883. | Iodoform. | 28 years, 2 children. | ...... | ...... | 1 | ...... | 1, end of 1 year. |
| | ... | Oct. 23, 1883. | ........................................ | 40 years, mar'd nullip. | Cervix. | ...... | 1 | ...... | 1, end 6 months. |
| | ... | Nov. 10, 1883. | ........................................ | 44 years, 8 children. | ...... | ...... | 1 | | |
| | ... | Nov. 15, 1883. | Applied chromic acid two weeks previous to operation; tampon first removed 5th day; ligatures removed 22d day; left bed 24th day. | ........ | ...... | ...... | 1 | ...... | 1, end of 6 months. |
| Terrier Gaz. des Hôp, 1885, p. 606; (Trélat) Gaz. des Hôp, 1885, p. 669. | 2 | ........ | Mass ligatures; stumps treated like ovariotomy pedicle; open peritoneal wound; drain; single suture in supravaginal wound. | ........ | ...... | 1 | 1 | | |
| Teuffel, V. (Haidler), Arch f. Gyn., xix. p. 106. | 5 | June 12, 1880. | Opened Douglas's sac high as possible; secured peritoneum from retraction; placed sponge in cavity; retroverted uterus; mass ligatures including lat. vag. wall; peritoneum closed leaving stumps out; no tampon; operation five hours. | 50 years, 2 children. | Cervix. | ...... | 1 | ...... | 1, end of 1½ years. |
| | ... | Aug. 31, 1880. | ........................................ | 33 yrs., 8 child. in ten years, | Cervix. | ...... | 1 | 1, immediate. | |
| | ... | Nov. 22, 1880. | Operation 2½ hours. | 35 years, 4 children. | Body. | 1, 3d day, sepsis. | | | |
| | ... | May 3, 1881. | Operation 5 hours. | 45 years, 8 children. | Portio vaginalis. | 1, 4th day, sepsis. | | | |
| | ... | May 5, 1881. | Operation 2½ hours. | 45 years, 4 children. | Cervix. | 1, septicæmia. | | | |

TABLE I.—*Concluded.*

| Operator, and where reported. | No. of cases. | Date of operation. | Method of operation. | Patient's age and number of births. | Variety of growth. | Died. | Survived. | Disease returned. | No. reported well after operation. |
|---|---|---|---|---|---|---|---|---|---|
| THIERSCH (Sänger, l. c.) | 4 | ......... | ......................................... | ......... | ...... | 1 | 3 | | |
| TILLAUX. | 1 | ......... | Vag. incised, ant. and post.; peritoneum left open; drain; single vaginal suture; iodoformized tampon. | ......... | ...... | ...... | 1 | | |
| TRÉLAT, Gaz. des Hôp, July 23, 1885. | 1 | July 2, 1884. | ......................................... | ......... | ...... | ...... | 1 | ...... | 1, end of 1 year. |
| VECCHI, DE, San Francisco, Lancet, May, 1883, Abst. in C. F. G., 1883, p. 695. | 1 | ......... | Mass ligatures; uterus liberated by galvanocautery wire; salicylated tampon. | 53 years. | ...... | ...... | 1 | | |
| VEIT, J., Deutsch. med Wochen., Jan. 3, 1883. | 2 | ......... | ......................................... | 65 years, 7 children. | Body. | ...... | 1 | | |
| | | | Schröder's method. | 58 years, virgin. | Body. | ...... | 1 | | |
| WALLACE, Br. Med. Journ., Dec. 1884. | 3 | Jan. 31, 1884. | Previously cut away diseased tissue with bistoury; retroverted uterus; used elastic mass ligature secured from sliding by harelip pin; closed supravaginal wound; no drain; patient left in half sitting position. | ......... | ...... | ...... | 1, highest temp. 100.5° | | |
| | ... | April 28, 1884. | ......................................... | 47 years, 8 children. | Cervix and vag.; nodule rt. brd. lig. | ...... | 1 | | |
| | ... | May 21, 1884. | Operation difficult. | 56 years. | Cervix, cavity in uterus 3¼ in. | 1, collapse 24 hours after oper. | | | |
| WEIR, Phil. Med. News, June 17, 1885. | 1 | Nov. 10, 1884. | Anteverted uterus; mass ligatures; opened post. cul-de-sac last; united peritoneum; iodoformized peat bags in vagina; no drain. | 40 years. | ...... | ...... | 1 | | |
| WILE, N. Eng. Med. Mo., 1882–3, ii. 207. | 1 | ......... | ......................................... | ......... | ...... | 1, 4th day. | | | |
| WILLETS (Mason), St. Barth. Hosp. Rep., 1883, xix. p. 111. | 2 | ......... | ......................................... | 34 years, | ...... | 1, peritonitis | ...... | 1, end 10 months. | |
| | | | | 37 years, | ...... | ...... | 1 | | |
| ZWEIFEL, C. f. G., June, 28, 1884. | 3 | June, 1882. | Vag. incised ant. and post.; uterus retroverted and divided vertically; no mass ligatures; no sutures; no drain; iodoformized tampon. | 35 years. 12 children. | Cervix. | 1, peritonitis 3d day. | | | |
| | ... | ......... | ......................................... | ......... | Cervix.<br>Cervix; body enlarged; fundus half way to umbilicus. | ...... | 1, highest temp. 38.2°. 3d day. | ...... | 1 |
| | ... | April, 1884. | Bowels first evacuated twelfth day. | ......... | Cervix. | ...... | 1 | | |
| Total, | 341 | ......... | ......................................... | ......... | ...... | 93 | 248 | | |

Martin's method is distinguished by the fact that he operates *in situ*, that he ligates the vaginal wall before incision, and that he covers the supravaginal wound. For his latest cases Martin has used the tampon of iodoformized gauze.

Schatz[1] also first opened Douglas's sac and united the vaginal wall to the bottom of the cul-de-sac by a chain of stitches before division. Schatz's method is further distinguished by the fact that he opened Douglas's sac to its deepest portion, that he left the peritoneal cavity freely open, and that he used no tube. During convalescence the patient was made to maintain a semi-erect position by reclining in a kind of chair.

Von Teuffel,[2] on the contrary, opened Douglas's sac as high as possible. He used mass ligatures which included the lateral vaginal wall. He used peritoneal sutures, completely closing the cavity and leaving the stumps out. He used neither tampon nor drain.

Baum[3] left the peritoneal wound open and used a tube. He did not use prophylactic injections, but only when the temperature commenced to rise. He removed the drainage tube on the fifth or sixth day.

Müller[4] cut anteriorly and posteriorly, leaving the lateral walls of the vagina intact until the uterus had been turned out. The uterus was inverted through the posterior wound. He then passed a thick provisional ligature around each broad ligament, including the lateral vaginal wall, and divided the uterus vertically into halves before removing it. He ligated the vessels separately, both in the stumps and in the vaginal wall. He sank the stumps, using no sutures, and closing the vagina with a carbolized tampon. This division of the uterus before removal had been previously suggested by Corradi.[5]

Fritsch[6] divides the lateral vaginal wall first, penetrating as deeply as possible and ligating vessels as they are encountered. He next opens the anterior cul-de-sac, and unites the peritoneal border with the anterior vaginal wall by three or four sutures. He then anteverts the uterus and ties the broad ligaments in small sections, dividing them as tied, six or seven ligatures being employed upon each side. He opens the posterior cul-de-sac last, finally uniting the peritoneum with the vagina as before. He leaves the peritoneal cavity fully open, and uses no drain, but dusts the wounded surfaces with iodoform, and packs the vagina with iodoformized gauze, which has been undisturbed from seven to ten days.

Hahn[7] tied and divided the broad ligaments in small sections, cut his ligatures short, left the wound fully open, and used no drain. He blew a drachm of iodoform into the wound and filled the vagina with iodoformized gauze.

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[1] Schatz, Arch. f. Gyn., 1883, xxi. p. 409.

[2] Haidlen, Arch. f. Gyn., xix. p. 106.

[3] Baum, Arch. f. Gyn., xiv. p. 481.

[4] Müller, Wien. med. Wochenschr., Feb. 23, 1884.

[5] Trans Internat. Med. Congress, London, 1880, iv. p. 325.

[6] Fritsch, Die Krankheiten der Frauen, 1884, p. 314; Bokelmann, Arch. f. Gyn., 1884, p. 75.

[7] Hahn, Berl. klin. Wochenschr., 1882, p. 361.

Sänger,[1] while advocating a complete peritoneal seam, in his own cases, left the wound open, and used no drainage. Sänger employed iodoform, but considered the quantity used by Schatz dangerous. He blew in about a gramme and used iodoformized tampon.

Staude[2] makes a circular vaginal incision, retroverts the uterus, uses mass ligatures, and divides the anterior cul-de-sac after the other uterine attachments have been divided. He completely closes the peritoneum and unites the vagina around a drain.

Tauffer[3] also retroverted the uterus. He closed the peritoneum and united the supravaginal wound around a drain.

Demons[4] leaves the peritoneum open and uses no drain, but a tampon of iodoformized gauze.

Terrier[5] uses mass ligatures tied like the ligature of the ovariotomy pedicle, leaves the peritoneal wound open, and draws the supravaginal wound together by a single suture about a drain.

Bottini[6] first called attention to the value of previous amputation of the diseased cervix. Otherwise he proceeds, in the main, according to Schröder's method.

Simpson[7] divided the uterus vertically and used the cautery in its removal. He had secondary hemorrhage, and remarked that another time he would preferably rely upon ligatures and the knife.

Wallace[8] previously cuts away the diseased tissue with a bistoury, retroverts the uterus, and uses elastic mass ligatures, preventing them from sliding by the harelip pin. He does not try to unite the peritoneal edges, but closes the supravaginal wound, using no drain. The patient is kept in a half-sitting position, after the operation, according to Schatz's directions.

Fenger[9] anteverted the uterus, used mass ligatures, and united the peritoneum, using a drain and permanent irrigation in the supravaginal wound.

Mundé,[10] in the main, follows the method of Schröder.

Bernays[11] first lays two mass ligatures, including the vaginal walls and the parametria so far as they can be reached. He then divides the vagina within these ligatures by a circular incision, opens the anterior cul-de-sac, anteverts the uterus, ties the upper part of the broad ligament, and divides it, and later the lower part. He brings the ligatures into the vagina, and uses no sutures, tampon, nor drain. Injections of pure water are made four times in the twenty-four hours. No disinfectant is used either during the operation or during the subsequent treatment.

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[1] Sänger, Arch. f. Gyn., 1883, xxi. p. 99.

[2] Staude, Deutsch. med. Wochenschr., 1883, p. 659.

[3] Tauffer, Arch. f. Gyn., 1884, xxiii. p. 367.

[4] Demons, Arch. Gén. de Méd., 1883, vol. ii. p. 257.

[5] Terrier, Gaz. des Hôpitaux, 1885, p. 606.

[6] Tansini, Gaz. Med. Ital., Lombard, April 17, 1881; Bizzozero, Cent. f. Chir., 1882, p. 208.

[7] Simpson, Edin. Med. Journ., 1882–83, p. 425.

[8] Wallace, Brit. Med. Journ., Dec. 1884.

[9] Fenger, Am. Journ. Med. Sci., 1882, p. 17.

[10] Mundé, Trans. Am. Gyn. Assoc, 1884.

[11] Bernays, St. Louis Med. and Surg. Journ., p. 369, 1884.

THE TOTAL AVERAGE MORTALITY.—Statistics in regard to the mortality of kolpohysterectomy have been at different times collected.[1] According to these figures, the mortality from the operation would appear to have increased during the first years of its performance. Careful examination of the records now at our command does not, however, sustain this view. Many of the operations done during the first years were not reported until later, and, hence, their failures lowered the percentage of a more successful date.

The proof of this assertion is found in Table II. of this paper, where the 341 cases are tabulated according to the date of the operation where it could be found, this list being added to a supplementary list made up of operations whose date is not given, and which were classified according to the date of the report. While the results of this computation are also open to criticism, it is evident that they must approach more nearly to accuracy than do those of lists made out entirely from the date of the report.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| The total mortality | at | the end | of | 1880 | was | 37 | per cent. |
| " | " | " | " | 1881 | " | 31 | " |
| " | " | " | " | 1882 | " | 29 | " |
| " | " | " | " | 1883 | " | 29 | " |
| " | " | " | " | 1885[2] | " | 27 | " |

THE MORTALITY FOR SEPARATE YEARS.—The record for separate years shows the same steady improvement. As shown by Table II.:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Cases | done | previous to the end | of | 1880, | had a | mortality of | 37 | per cent. |
| " | " | or reported | during | 1881, | " | " | 27 | " |
| " | " | " | " | 1882, | " | " | 27 | " |
| " | " | " | " | 1883, | " | " | 28 | " |
| " | " | " | " | 1885, | " | " | 24 | " |

The increased mortality shown by the list for 1883 is manifestly due to the great number of scattered cases of remote date, which were during that period reported. The mortality of the cases in which the operation was actually done during 1883 was but 22 per cent.

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[1] Kaltenbach, Op. Gyn., 409, 1880, collected a total of 29 cases, with a mortality of 27 per cent.; Olshausen, Berl. klin. Wochenschr., 1881, No. 35, 41 cases, with a mortality of 29 per cent.; Haidlen, Arch. f. Gyn., xix. p. 106, 52 cases, with a mortality of 37 per cent.; Czerny, Berl. klin. Wochenschr., 1882, Nos. 46 and 47, 81 cases, with a mortality of 32 per cent.; Sänger, Arch. f. Gyn., 1883, h. 1, p. 99, 133 cases, with a mortality of 28 per cent.; Mundé, Trans. Am. Gyn. Assoc., 1884, 254 cases, with a mortality of 28 per cent.; Duncan, Brit. Med. Journal, Jan. 31, 1885, 276 cases, with a mortality of 28 per cent.; Doche, l. c., also a list, with a mortality of 28 per cent.

[2] The results of 1884 and 1885 are tabulated together, because a fairer percentage can thus be obtained, the report for 1885 being yet necessarily imperfect.

## TABLE II.

### OPERATIONS PERFORMED OR REPORTED DURING THE YEARS 1884–85.

| Performed. | No. | Died. | Rec. | Reported without date. | No. | Died. | Rec. |
|---|---|---|---|---|---|---|---|
| Bernays | 2 | 0 | 2 | Bopp | 3 | 2 | 1 |
| Bottini | 1 | 0 | 1 | Bull | 1 | 1 | 0 |
| Demons | 1 | 0 | 1 | Duncan | 1 | 0 | 1 |
| Düvelius | 2 | 0 | 2 | Engström | 2 | 1 | 1 |
| Fritsch | 17 | 0 | 17 | Foreman | 1 | 0 | 1 |
| Gardner | 1 | 1 | 0 | Goodell | 1 | 1 | 0 |
| Giommi | 1 | 1 | 0 | Herff | 1 | 0 | 1 |
| Mundé | 1 | 1 | 0 | Lebedev | 2 | 0 | 2 |
| Peruzzi | 1 | 0 | 1 | Martin | 21 | 4 | 17 |
| Purcell | 1 | 0 | 1 | Müller | 4 | 0 | 4 |
| Trélat | 1 | 0 | 1 | Noeggerath | 3 | 3 | 0 |
| Wallace | 3 | 1 | 2 | Novaro | 20 | 10 | 10 |
| Weir | 1 | 0 | 1 | Olshausen | 9 | 1 | 8 |
| Zweifel | 2 | 0 | 2 | Schröder | 6 | 2 | 4 |
| | | | | Staude | 10 | 0 | 10 |
| | | | | Terrier | 2 | 1 | 1 |
| | | | | Tillaux | 1 | 0 | 1 |
| Total | 35 | 4 | 31 | Total | 88 | 26 | 62 |
| Mortality | 11 per cent. | | | Mortality | 29 per cent. | | |

Total operations performed and reported during the years 1884–85 . 123 30 93

Mortality . . . . . . . . . 24 per cent.

### OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1883.

| Performed. | No. | Died. | Rec. | Reported without date. | No. | Died. | Rec. |
|---|---|---|---|---|---|---|---|
| Bernays | 1 | 0 | 1 | Ahlfeld | 2 | 1 | 1 |
| Boeckel | 1 | 0 | 1 | Bogoluboff | 1 | 0 | 1 |
| Breisky | 1 | 0 | 1 | Bolling | 1 | 1 | 0 |
| Bull | 1 | 0 | 1 | Burke | 1 | 0 | 1 |
| Calderini | 1 | 0 | 1 | Dudon | 2 | 1 | 1 |
| Demons | 5 | 3 | 2 | Duncan | 1 | 1 | 0 |
| Düvelius | 2 | 0 | 2 | Holmer | 1 | 0 | 1 |
| Fritsch | 7 | 2 | 5 | Mandillon | 1 | 0 | 1 |
| Johannovsky | 1 | 0 | 1 | Sänger (G.) | 2 | 1 | 1 |
| Kufferath | 1 | 0 | 1 | Sänger (L.) | 1 | 0 | 1 |
| Mundé | 2 | 1 | 1 | Schatz | 3 | 2 | 1 |
| Tauffer | 4 | 0 | 4 | Schröder | 20 | 6 | 14 |
| | | | | Solovieff | 1 | 0 | 1 |
| | | | | Solowiew | 1 | 0 | 1 |
| | | | | Staude | 3 | 0 | 3 |
| | | | | Stewart | 1 | 0 | 1 |
| | | | | Studsgaard | 1 | 0 | 1 |
| | | | | (Howitz) | 2 | 2 | 0 |
| | | | | Thiersch | 4 | 1 | 3 |
| | | | | Vecchi, de | 1 | 0 | 1 |
| | | | | Veit, J. | 2 | 0 | 2 |
| | | | | Willets | 2 | 1 | 1 |
| Total | 27 | 6 | 21 | Total | 54 | 17 | 37 |
| Mortality | 22 per cent. | | | Mortality | 31 per cent. | | |

Total operations performed and reported during the year 1883 . . 81 23 58

Mortality . . . . . . . . . . 28 per cent.

### OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1882.

| Performed. | No. | Died. | Rec. | Reported without date. | No. | Died. | Rec. |
|---|---|---|---|---|---|---|---|
| Brendel | 1 | 0 | 1 | Anderson | 1 | 0 | 1 |
| Hahn | 3 | 0 | 3 | Bottini | 2 | 0 | 2 |
| Howitz | 2 | 0 | 2 | Burke | 1 | 0 | 1 |
| Kraussold | 2 | 0 | 2 | Demons | 1 | 0 | 1 |
| Paggi | 1 | 1 | 0 | Esmarch | 2 | 1 | 1 |
| Schatz | 4 | 1 | 3 | Helferich | 1 | 0 | 1 |
| Simpson | 1 | 1 | 0 | Martin | 31 | 8 | 23 |
| Staude | 1 | 0 | 1 | Olshausen | 17 | 6 | 11 |
| Zweifel | 1 | 1 | 0 | Wile | 1 | 1 | 0 |
| Total | 16 | 4 | 12 | Total | 57 | 16 | 41 |
| Mortality | 25 per cent. | | | Mortality | 28 per cent. | | |

Total operations performed and reported during the year 1882 . . 73 20 53

Mortality . . . . . . . . . . 27 per cent.

### OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1881.

| Performed. | No. | Died. | Rec. | Reported without date. | No. | Died. | Rec. |
|---|---|---|---|---|---|---|---|
| Bottini | 2 | 0 | 2 | Bardenheuer | 1 | 1 | 0 |
| Cushing | 1 | 0 | 1 | Bompiani | 1 | 1 | 0 |
| Czerny | 3 | 1 | 2 | Billroth | 6 | 1 | 5 |
| Fenger | 1 | 0 | 1 | Caselli | 1 | 1 | 0 |
| Hahn | 2 | 1 | 1 | Kocher | 1 | 0 | 1 |
| Olshausen | 6 | 0 | 6 | | | | |
| Sänger | 1 | 0 | 1 | | | | |
| Schatz | 3 | 0 | 3 | | | | |
| Starck | 1 | 0 | 1 | | | | |
| Staude | 1 | 0 | 1 | | | | |
| Tauffer | 1 | 1 | 0 | | | | |
| Teuffel | 2 | 2 | 0 | | | | |
| Total | 24 | 5 | 19 | Total | 10 | 4 | 6 |
| Mortality | 20 per cent. | | | Mortality | 40 per cent. | | |

| | No. | Died. | Rec. |
|---|---|---|---|
| Total operations performed or reported during 1881 | 34 | 9 | 25 |
| Mortality | 27 per cent. | | |

### OPERATIONS PERFORMED BEFORE AND DURING 1880.

| Performed. | No. | Died. | Rec. |
|---|---|---|---|
| Baum | 4 | 2 | 2 |
| Billroth | 6 | 3 | 3 |
| Czerny | 5 | 2 | 3 |
| Pawlik | 1 | 0 | 1 |
| Schede | 2 | 2 | 0 |
| Schröder | 8 | 1 | 7 |
| Staude | 1 | 0 | 1 |
| Teuffel, v. | 3 | 1 | 2 |
| Total | 30 | 11 | 19 |
| Mortality | 37 per cent. | | |

| | No. | Died. | Rec. |
|---|---|---|---|
| Total operations performed before and during the year 1880 | 30 | 11 | 19 |
| Mortality | 37 per cent. | | |
| Total operations performed and reported during the years 1881, 1880 | 64 | 20 | 44 |
| Mortality | 31 per cent. | | |
| Total operations performed and reported during the years 1882, 1881, 1880 | 137 | 40 | 97 |
| Mortality | 29 per cent. | | |
| Total operations performed and reported during the years 1883, '82, '81, '80 | 218 | 63 | 155 |
| Mortality | 29 per cent. | | |
| Total operations performed and reported during 1884–5, '83, '82, '81, '80 | 341 | 93 | 248 |
| Mortality | 27 per cent. | | |

The report of the single operator, as shown by Table II., is also of interest. Previous to 1881 Billroth lost 3 out of 6 cases; subsequently Billroth lost but 1 out of 6 cases. Schröder, on the contrary, previous to 1881 lost but 1 out of 8 cases, while subsequently he has lost 6 out of 20, and 2 out of 6. In 1882 Martin reported himself as having lost 8 out of 31 cases, while in 1885 Düvelius reports him as having lost but 5 out of 55. In 1881 Olshausen operated 6 times successfully; in 1882 he reported 6 deaths out of 17 additional cases; and in 1884 10 additional, of which he lost but 1. In 1883 Fritsch lost 2 out of 7 cases. In 1884 and 1885 he reported 17 additional cases, without a death. Staude, a recent operator, has done 16 operations, without a death.

MORTALITY ACCORDING TO THE TREATMENT OF THE WOUND.—The history of this operation is but a short one, yet two distinct periods of advancement in its results may be distinctly traced. The first occupies 1881 and 1882, during which the total mortality fell from 37 per cent. to 29 per cent. The second occupies the years of 1884 and 1885, during which the total mortality has fallen from 29 per cent. to 27 per cent.

The first of these periods corresponds with the introduction of iodoform in the treatment of wounds. The second has coincided with the adoption of certain precautions in the course of the operation itself, and certain further peculiarities in the subsequent treatment.

In all recent operations the diseased cervix has been either amputated, curetted, or cauterized previous to the first incision.

The different methods of subsequent procedure vary, first, in the vaginal incision, which has been circular according to the most common practice, but which has also been confined to the anterior and posterior walls, the lateral walls being retained to be included in the mass ligatures, as done by Müller and Bernays, or confined to the lateral walls for the division and securing of the uterine artery, previous to the anterior and posterior division, as practised by Fritsch. The different methods vary, secondly, in the position of the uterus, which may be fixed *in situ*, as done by Martin; simply pulled down, as done by Billroth; retroverted and the fundus made to present at the vulva, as done by Schröder; or anteverted and brought out through the anterior cul-de-sac, as done by Czerny in a number of cases. Thirdly, they may differ in the order of the opening of the cul-de-sacs, whether both be opened previous to the eversion of the uterus, as is the commonest practice, or whether the anterior cul-de-sac only be opened where the uterus is turned out by anteversion, or the posterior cul-de sac only be opened where the uterus is turned out by retroversion, until the broad ligaments have been tied and divided, and the uterus prepared for complete removal. This precaution prevents any secretion of the uterus from penetrating the cavity of the peritoneum during inversion. They differ, fourthly, in the use of the mass ligature, whether one, two, three, or many; whether the whole ligament be secured and divided at once, as was done in the earlier operations; whether it be tied in small sections and divided step by step, as done by Fritsch; or whether, on the other hand, vessels be tied separately as encountered, with or without a provisional mass ligature. They differ, fifthly, in the treatment of the mass ligatures, whether they be cut short and sunken, or whether they be kept long and brought out into the vagina to assist in drainage. Sixthly, they differ in the treatment of the peritoneal wound, whether it be completely closed, as done by v. Teuffel; be united around a drain, according to the early practice of Billroth; be left completely open with a drain, as practised by Martin, Baum, Olshausen, and by Billroth in some later cases; or whether it be left completely open without a drain, as practised by Fritsch, Demons, Müller, Billroth, Schatz, Bernays, and others. They differ, seventhly, in the treatment of the supravaginal wound, whether it be closed around a drain, as done by Schröder; closed without a drain, as done by Goodell and Wallace; left completely open, with or without a drain; or whether it be covered by peritoneum, the peritoneum of the cul-de-sac being united to the mucous membrane of the vagina, as practised by Martin, Schatz, Fritsch, and Von Herff. They differ, eighthly, in the use or omission of injections, or the tampon of iodoformized gauze.

If we except the previous treatment of the diseased part by amputation, the curette, or the caustic, and the protection of the peritoneal cavity during inversion of the uterus, the contested points here enumerated concern only questions of facility in operation until we arrive at the treatment of the wound, which supremely concerns the immediate mortality of the result.

In Table III. of this paper is a statement of the mortality list, classified according to the treatment of the wound, where this has been detailed. This Table utilizes 280 cases having a total mortality of 23 per cent. As the total average mortality of the whole number of cases is 27 per cent., it is apparent that Table III. cannot give an exaggerated impression of the mortality list; that if all cases had been detailed, the true mortality list for any method would have been higher rather than lower than that here obtained. Full credit, therefore, may be given to this Table, wherever, by falling below the average, it proves the failure of a method.

Of the 280 cases, in 58 the peritoneal wound was closed either with or without a drain, with a mortality of 28 per cent. In 20 of these the supravaginal wound was left open with a drain, with a mortality of 40 per cent., while in 30 cases the supravaginal wound was closed around a drain, with a mortality of 13 per cent. In 8 cases the supravaginal wound was left open without a drain. Of these 8, 4 died.

On the other hand, in 222 cases the peritoneal cavity was left open with and without a drain, with a mortality of 22 per cent. In 81 of these cases the supravaginal wound was left open with and without a drain, with a mortality of 23 per cent., while in 141 cases the supravaginal wound was closed, with a mortality of 21 per cent. Of the 141 cases, in 48 cases the supravaginal wound was drawn together, completely, or around a drain, with a mortality of 27 per cent.; and in 93 cases the supravaginal wound was covered by peritoneum, with a mortality of 18 per cent. Of the 81 cases with the supravaginal wound open, 45 were treated with a drain, with a mortality of 24 per cent.; 36 were treated without a drain, with a mortality of 22 per cent. Of the 48 in which the edges of the supravaginal wound were brought together, 44 were treated with the drain, with a mortality of 25 per cent.; 4 were treated without the drain; and of the 4, 2 died. Of the 93 in which the supravaginal wound was covered by peritoneum, 57 were treated with the drain, with a mortality of 21 per cent., and 36 without the drain, with a mortality of 14 per cent.

## TABLE III.

### CLOSED PERITONEAL WOUND.

Supravaginal wound open.

With drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Billroth, 1879–80, | 7 | 3 | 4 |
| Bompiani, 1881, | 1 | 1 | 0 |
| Breisky, 1882, | 1 | 0 | 1 |
| Dudon, 1883, | 2 | 1 | 1 |
| Fenger, 1881, | 1 | 0 | 1 |
| Gardner, 1884, | 1 | 1 | 0 |
| Howitz, 1882–83, | 2 | 0 | 2 |
| Mandillon, 1883, | 1 | 0 | 1 |
| Paggi, 1882, | 1 | 0 | 1 |
| Schede, 1880, | 2 | 2 | 0 |
| Solovieff, 1883, | 1 | 0 | 1 |
| Total, | 20 | 8 | 12 |
| Mortality, | 40 per cent. | | |

Without drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Brendel, 1882, | 1 | 0 | 1 |
| Bull, 1883, | 2 | 1 | 1 |
| Teuffel, 1880–81, | 5 | 3 | 2 |
| Total, | 8 | 4 | 4 |
| Mortality, | 50 per cent. | | |

Supravaginal wound closed.

With drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Czerny, 1878–81, | 8 | 3 | 5 |
| Mundé, 1883, | 1 | 0 | 1 |
| Staude, 1880–85, | 16 | 0 | 16 |
| Tauffer, 1881–84, | 5 | 1 | 4 |
| Total, | 30 | 4 | 26 |
| Mortality, | 13 per cent. | | |

Total supravaginal wound open and closed . . . . . . . . . 58 16 42
Mortality . . . . . . . . . . 28 per cent.

### PERITONEAL WOUND OPEN.

Supravaginal wound open.

With drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Bauer, 1881 . . | 4 | 2 | 2 |
| Billroth, 1880 . . | 3 | 1 | 2 |
| Johannovsky, 1883 . | 1 | 0 | 1 |
| Olshausen, 1881–84 . | 32 | 7 | 25 |
| Pawlik, 1880 . . | 1 | 0 | 1 |
| Purcell, 1884 . | 1 | 0 | 1 |
| Terrier, 1884 . . | 2 | 1 | 1 |
| Tillaux, 1884 . . | 1 | 0 | 1 |
| Total . . | 45 | 11 | 34 |
| Mortality . | 24 per cent. | | |

Without drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Bernays, 1884 . . | 3 | 0 | 3 |
| Billroth, 1880 . . | 2 | 0 | 2 |
| Caselli, 1882 . . . | 1 | 1 | 0 |
| Cushing, 1881 . . | 1 | 0 | 1 |
| Demons, 1882–84 . . | 7 | 3 | 4 |
| Engström, 1884 . . | 2 | 1 | 1 |
| Hahn, 1881–82 . . | 5 | 1 | 4 |
| Kocher, 1881 . . . | 1 | 0 | 1 |
| Müller, P., 1884 . . | 4 | 0 | 4 |
| Sänger (L.) . . . | 1 | 0 | 1 |
| Starck, 1881 . . . | 1 | 0 | 1 |
| Thiersch, 1883, . . | 4 | 1 | 3 |
| Weir, 1885 . . . | 1 | 0 | 1 |
| Zweifel, 1882–84 . . | 3 | 1 | 2 |
| Total . . . | 36 | 8 | 28 |
| Mortality . . | 22 per cent. | | |

Total . . . . . . . . . . . . . . 81 19 62
Mortality . . . . . . . 23 per cent.

Supravaginal wound closed. Edges brought together.

With drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Bottini, 1881–85 . . | 5 | 0 | 5 |
| Mundé, 1883–84 . . | 2 | 2 | 0 |
| Schröder, 1880–84 . | 34 | 9 | 25 |
| Solowiew, 1883 . . | 1 | 0 | 1 |
| Veit, J., 1883 . . | 2 | 0 | 2 |
| Total . . . . | 44 | 11 | 33 |
| Mortality . . | 25 per cent. | | |

Without drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Goodell, 1884 . . . . | 1 | 1 | 0 |
| Wallace, 1884 . . . . | 3 | 1 | 2 |
| Total . . . . | 4 | 2 | 2 |
| Mortality . . . | 50 per cent. | | |

Total . . . . . . . . . . . . 48 13 35
Mortality . . . . . . . 27 per cent.

Supravaginal wound closed. Peritoneum sewed to vaginal wall.

With drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Düvelius, 1883–85 . | 4 | 0 | 4 |
| Foreman, 1884 . . | 1 | 0 | 1 |
| Martin, to 1882 . . | 31 | 8 | 23 |
| 1882–84 . | 21 | 4 | 17 |
| Total . . . | 57 | 12 | 45 |
| Mortality . . | 21 per cent. | | |

Without drain.

| | No. | Died. | Rec. |
|---|---|---|---|
| Fritsch, 1883–85 . | 24 | 2 | 22 |
| V. Herff, 1885 . . | 1 | 0 | 1 |
| Schatz, 1881–83 . . | 10 | 3 | 7 |
| Sänger (L.), 1883 . | 1 | 0 | 1 |
| Total . . . | 36 | 5 | 31 |
| Mortality . . | 14 per cent. | | |

Total . . . . . . . . . . . . . . 93 17 76
Mortality . . . . . . . . 18 per cent.
Total supravaginal wound closed . . . . . . . . 141 30 111
Mortality . . . . . . . . 21 per cent.
Total, supravaginal wound open and closed . . . . . . 222 49 173
Mortality . . . . . . . 22 per cent.

While the good results of Tauffer and of Staude show that complete closure of the peritoneal wound is no obstacle to the success of this operation, Table III. also shows that it is not essential to this success. Apparently complete closure of the peritoneum requires especial precautions or especial skill, as a high mortality has generally occurred where it has been attempted.

The treatment of the supravaginal wound is also a matter of importance. When the peritoneal cavity has been left open, the best results have been obtained where the peritoneum has been united to the mucous membrane of the vagina, closing the supravaginal wound. The leaving the supravaginal wound open, with a drain or without a drain, and the uniting the supravaginal wound around a drain, all show results up to the general average, while the complete closure of the supravaginal wound by approximating its edges without drainage, has had bad results, whether the peritoneal cavity were left open or closed. In general terms, therefore, we should either leave the supravaginal wound fully open, drain the supravaginal wound, or completely seal it by covering it with peritoneum, the weightiest evidence being at present in favor of the latter method.

The previous treatment of the diseased part, the protection of the peritoneal cavity during the operation, and the subsequent use of iodoform, are now matter of routine, the omission of which would be culpable.

The permanent tampon of iodoformized gauze recommends itself as furnishing a disinfecting atmosphere, together with that great gift of antiseptic surgery, namely, rest in the treatment of its wounds.

## TABLE IV.

### TABLE OF RECURRENCE.

| | Well at the end of about 1 year. | Well at the end of about 2 years. |
|---|---|---|
| Bernays (Chip), May 15, 1885 | 1 | 1 |
| Demons, Bull. et Mém. de la Soc. de Chir. de Paris | 1 | 1 |
| Dudon (Terrier), Bull. et Mém. de la Soc. Chir., 1885, x. n. 32 | 1 | 1 |
| Düvelius, Deutsch. med. Wochen., Feb. 26, 1885 | 1 | 1 |
| Martin, Path. u. Ther. der Frauenkheiten, 1885, p. 303 | 8 | 8 |
| Novaro, Abst. Br. Gyn. Journ , April, 1885 | 3 | .. |
| Olshausen, Beiträge zur Gyn., 1884, p. 107 | 7 | 4 |
| Schatz, Arch. f. Gyn., 1883, xxi. 409 | 1 | 1 |
| Staude, Deutsch. med. Wochen., 1883, p. 659 | 1 | ... |
| Tauffer, Arch. f. Gyn., 1884, xxiii. p. 367 | 2 | ... |
| Teuffel, v., Arch. f. Gyn., xix. p. 106 | 1 | ... |
| Trélat, Gaz. des Hôp., July 23, 1885 | 1 | ... |
| Zweifel, Centralblatt f. Gyn., June 28, 1884 | 1 | 1 |
| Total | 29 | 18 |

QUESTION OF RECURRENCE.—From Table IV. of this paper it is seen that 18 cases which have survived the operation have been well at a period varying between eighteen months and two years after. As the reports from which this table was drawn were not made later than the last of 1884 or the beginning of 1885, it is apparent that the cases referred to were operated upon previous to the end of 1882. Referring to Table II., we find that approximately 137 cases were operated upon during that period, and of this number, 97 survived the operation. Of this 97, therefore, 18, or 20 per cent., were well at the end of eighteen months or two years.

Finding that recurrence is most general within the first year of the operation, cases which remain well at the end of eighteen months or two years are commonly considered cured.

Statistics of cures are, I find, made upon three plans: First, the number in whom recurrence is known are subtracted from the whole number of survivors, and the remainder are counted as cured, and the percentage is computed upon the number of survivors of the operation; second, the number absolutely known to be well only are counted as cured, but the percentage of such cures is estimated only upon the number of survivors whose histories have been followed; and, third, the number known to be well only are counted as cured, and the percentage is estimated upon the whole number who have survived the operation.

It is apparent that great discrepancies in reports can be accounted for by the method in which they have been made out.

In these tables the percentage of cures represents cases known to be well, and is estimated upon the whole number who survived the operation. The percentage of cures would probably have been higher could the number of cures among cases which passed from under observation also have been estimated. Hofmeier remarks that where patients have not reported they have usually remained well.

From Table IV. it appears that one out of five patients who survived the operation has remained well. Schröder and Olshausen obtain a cure in one out of three cases which survive the operation, and Martin, in one out of two cases, a result which is as good, if not better, than that of other operations for malignant disease (see Table V.).

### TABLE V.

### THE TOTAL NUMBER CURED COMPARED WITH THE RESULTS OF SINGLE OPERATORS, OF OTHER METHODS OF OPERATION, AND OF OTHER OPERATIONS FOR MALIGNANT DISEASE.

| | Cases. utilized. | Survived operation. | Per cent. of the survivors who remained well. |
|---|---|---|---|
| Kolpohysterectomy | 137 | 97 | 20 |
| " (Schröder[1]) | 12 | 9 | 33 |
| " (Olshausen[2]) | 23 | 16 | 44 |
| " (Martin[3]) | 19 | 16 | 50 |
| Vaginal and supravaginal amputation (Schröder[1]) | 52 | 47 | 32 |
| Galvanocautery amputation (Pawlik[4]) | 136 | 126 | 21 |
| Amputation with hot iron (Schröder[1]) | 13 | 12 | 42 |
| Extirpation of the breast (Volkmann's klinik[1]) | 131 | 121 | 15 |
| " " (Rose's klinik[1]). | ... | ... | 15 |
| " " (Billroth's klinik[1]) | ... | ... | 14 |
| Total extirpations for cancer (Billroth's klinik[1]) | 448 | ... | 23 |
| Extirpation of the tongue, pharynx, and rectum (Kocher[1]) | 25 | ... | 26 |
| Extirpation of the tongue (Billroth's klinik[1]) | ... | ... | 17 |
| Extirpation of the rectum (Rose's klinik[1]) | ... | ... | 12.4 |
| Kidney extirpation for neoplasms[5] | 33 | 13 | ... |

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[1] Hoffmeier, Zeitschr. f. Geb. u. Gyn., 1884, p. 285.

[2] Olshausen, Beiträge zur Gyn., 1884, p. 107.

[3] Martin, Path. u. Ther. der Frauenkheiten, 1885, p. 303.

[4] Pawlik, Wien. klinik, 1882, p. 425.

[5] Billroth, Wien. med. Wochen., 1884, n. 25, p. 774.

Opinions Regarding the Operation.—In Germany, in 1882, Rokitansky's was almost the only dissenting voice. At the present time the operation of kolpohysterectomy for cancer has been, within limits, accepted as a legitimate procedure.

In France, Pollaillon, in 1882, considered extirpation of the uterus an ill-advised operation, quoting West's statistics and the statistics of Freund's operation. In 1885, Pollaillon still prefers amputation, stating that in cancer of the cervix the disease does not early spread to the body, while in cancer of the body the diagnosis is uncertain.

Desprès and Championnière think that permanent cure of cancer of the uterus is impossible, that where the patient has remained well after the operation an error in diagnosis was made.

Demons, on the contrary, in 1883, said that total extirpation of the uterus by the vagina merited a better reception than had been accorded to it in France. It was practised upon subjects already condemned to a fatal issue, with the probability of a more or less prolonged accession of health, and with the possibility of a permanent cure. Demons states that the most usual time for the return is four or five months after the operation, with death at the end of twelve or fourteen months. Return may be in the cicatrix, but more often it is in the pelvic cellular tissue. He goes on to say that women suffer much less from the return than from the primitive growth, that hemorrhage is less frequent and less grave.[1]

Desoubroux, in speaking of extirpation of the kidney for cancer, says: "We must admit that there is a great probability of a return, yet we would operate, because, not to do so, is condemnation to certain death, while in favor of the operation is the fact that for some time after it the patient is comparatively free from the disease."

Terrier places extirpation of the uterus for cancer upon the same plane as extirpation of the kidney for malignant disease. Without being assured against its return, he would operate, because ablation is the only possible curative procedure.

Sebileau remarks: "The operation should be performed because, without it, the patient is doomed to certain death and to a disgusting infirmity; while, if there be a return after the operation, there is less danger of accidents and a diminution of pain."

In England, Duncan favors the operation for carcinoma or sarcoma of the body and cervix. Doran is opposed to the operation on the ground that the disposition of the lymphatics of the uterus is such as to make a radical extirpation of the disease impossible. Playfair thinks the operation of doubtful benefit, as the diagnosis of cancer is necessarily too late for complete removal. Purcell remarks that we should expect no more from extirpation of the uterus than from extirpation of the tongue or rectum for cancer, or from amputation of the breast. Sir Spencer Wells also thinks that we may yet learn much in regard to the technique of the operation, and that it ought not to be condemned.

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[1] Rev. de Chir., 1884, iv. 633.

In the United States, Polk considers the operation applicable only to primary cancer of the body. Where the body has been affected by extension from the cervix, he considers that the glands would have become already involved and thorough extirpation impossible.

Dr. Reeves Jackson, at the American Gynecological Association meeting in 1883, and again in 1885, strongly opposed the operation on account of its immediate mortality, and on account of the probable recurrence of the disease. Dr. Jackson's objections to the mortality list are based not upon the published reports, but upon a number of cases which he knows to have been unreported, and upon a further number of hypothetical unreported cases.

Mundé considers the operation justified in all cases of cancer of the uterus where the uterus is movable and the parametria uninvolved.

Bernays considers that the extirpation of the uterus for cancer will, in the near future, yield results equal to those of extirpation for cancer of the breast.

In general terms, while the advocates of this operation have abandoned the extravagant expectations of former years, they still anticipate of extirpation of the uterus for cancer as good results as those obtained upon other organs, by operations for malignant disease.

Indications for the Operation.—There is general agreement that operation need not be attempted where the uterus is fixed, where neighboring organs are affected, or where enlarged glands can be found. Of 812 cases of cancer seen by Schröder, he found operation indicated in but 160, and total extirpation in but 34 cases. During the last four and a half years Wallace has seen 71 cases, of which but 6 were operable. Bernays has during the last year seen 16 cases, of which only 2 were suitable for operation.

Schröder does this operation only where the body and cervix are affected, doing supravaginal amputation by the vagina where the disease implicates only the cervix, and supravaginal amputation by laparotomy where the body only is affected.

Müller considers total extirpation indicated under each of the three circumstances, the greater mutilation of total extirpation, and the possibility of successful pregnancy in the remnant of the uterine body left by Schröder, being denied.

Ruge and Veit[1] find that cancer of the body tends to spread to the peritoneum, and only appears very late as secondary nodules in the cervix. Cancer of the portio vaginalis tends to spread to the vagina and the lower part of the parametrial tissue, while cancer of the cervix spreads rapidly on the mucous surface, and early infiltrates the surrounding cellular tissue. Logically, they conclude that supravaginal amputation is indicated in cancer of the body and in cancer of the vaginal portion, in the former by laparotomy, and in the latter by the vagina, reserving total extirpation only for cancer of the cervix, when they say the involvement is too extensive to be otherwise removed, adding, however, that should the mortality of total extirpation diminish, so as to be less than that of partial extirpation, it would be, of course, indicated in preference to partial extirpation in all varieties of uterine cancer.

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[1] Zeitschr. f. Geb. u. Gyn , 1882, vii. p. 217.

RÉSUMÉ.—1. The results of kolpohysterectomy for cancer have progressively improved with increase of the number of operations.

2. The total number of operations done up to the present time is approximately 341, with a total mortality of 27 per cent. 222 cases were treated with the open peritoneal wound, with a mortality of 22 per cent. Of the 222, 93 had the supravaginal wound covered by peritoneum, with a mortality of 18 per cent.; and of the 93, 50 were operated upon during the past three years, with a mortality of 10 per cent.

3. Of 97 cases which survived operations done previous to 1883, 18, or 20 per cent., are known to have been well at the end of eighteen months or two years.

4. The latest results of kolpohysterectomy for cancer contrast not unfavorably with those of the total extirpation of other organs for malignant disease.

5. The tendency of medical literature is to regard kolpohysterectomy for cancer as a legitimate operation, subject only to the restrictions common to other extirpations for malignant disease.

In concluding, I desire to express my indebtedness to the New York Hospital Society and to the New York Academy of Medicine, for the use of their libraries in the preparation of this paper; also to Dr. P. F. Mundé, who kindly placed his library at my disposal.

# PRIMARY SARCOMA OF THE RIGHT KIDNEY.[1]

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INDEPENDENTLY of its rarity, the following case possesses some features of interest which appear to be deserving of record:

John D., aged fifty-three years, a brass finisher, was admitted under my care into Sir Patrick Dun's Hospital, October 25, 1884.

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[1] Read before the Medical Section of the Academy of Medicine in Ireland, 1885.

His family history was good, and he was not aware of any of his relatives having had "tumour." He escaped syphilis, and had never previously been seriously ill, although up to two years ago he was of intemperate habits, and drank freely of porter. He never suffered from jaundice, but twenty years ago a doctor told him that his liver was getting hard from drink. To the best of his belief he was in perfect health up to about two years ago, when, shortly after his return from America, he perceived a slight pain in the right side below the ribs. This gradually became worse, and some months later he noticed a swelling in the right side. Still he was able to persevere in his employment, which was somewhat laborious, but a month before admission his appetite failed and he gave up work. When in good health he weighed eleven stone, and, although he cannot fix his present weight, is certain that he has lost much flesh, especially within the last six weeks.

Some seven or eight years ago he states that he passed bloody(?) urine, attended with some pain and difficulty. Nothing of the kind recurred until seven or eight months ago, when, without apparent cause, he passed, with pain and difficulty, a "very dark fluid" from the urethra.

The man's aspect is haggard and worn, and he is in low spirits about himself. Physical examination yielded the following results:

*Thorax.*—Heart's sounds normal, rather feeble. Pulse 72. Respiratory sounds quite healthy: complains of some pain between the shoulders.

FIG. 1.

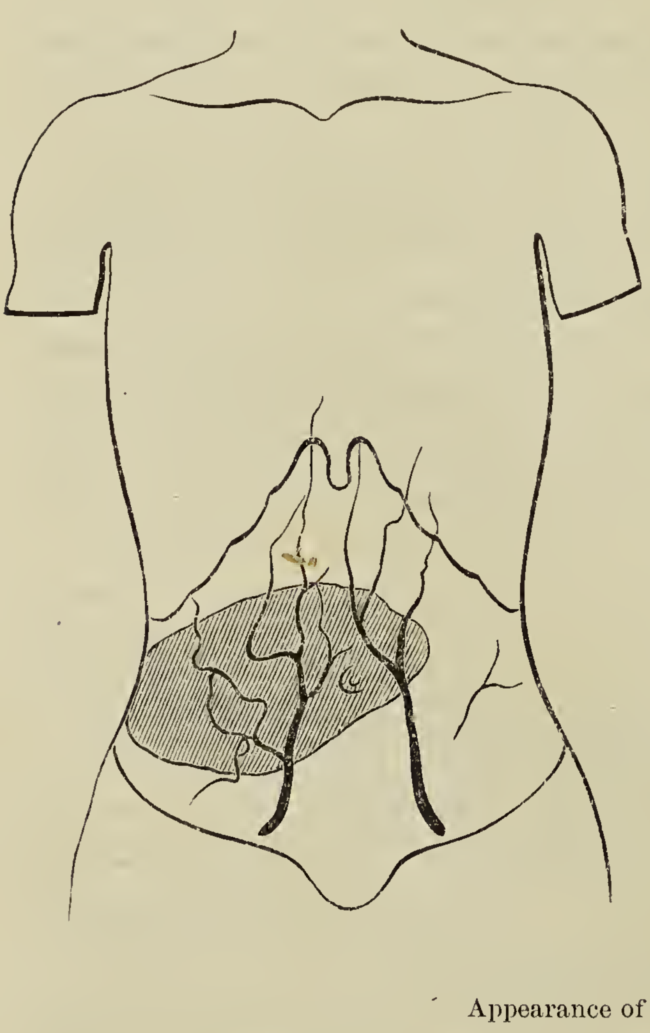
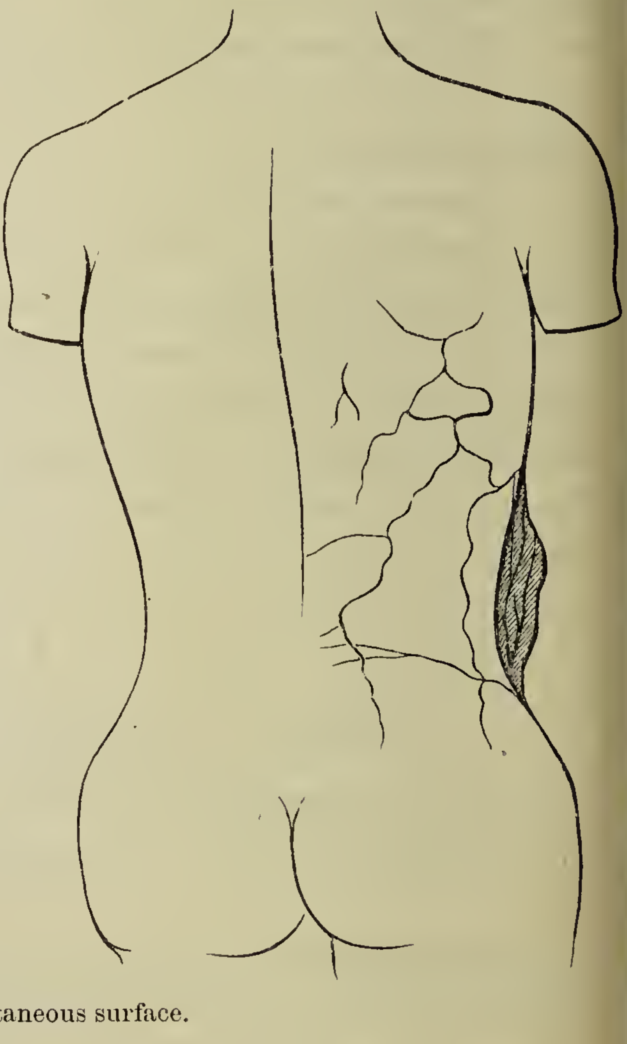


FIG. 2.



Appearance of the cutaneous surface.

*Abdomen.*—Skin white, and, on either side, especially the right, is a network of enlarged veins stretching up to the axilla, and also visible posteriorly. There was no evidence of fluid in the abdomen, but a large swelling projected on the right side, extending from the ribs to within two inches of the ilium, and laterally about two inches to the left of the umbilicus.

The tumor was firm in consistence, with a well-defined and rounded edge, and the swelling could be felt behind in the lumbar region, but could not be moved from side to side, nor did it follow the motions of the diaphragm.

That the tumor was not connected with the liver was shown by the ease with which the fingers could be pressed into the groove which existed between it and the ribs. No pulsation nor sound could be detected, and after repeated examinations it was impossible to make out any zone of clearness in front.

The tumor, which was diagnosticated as a malignant renal swelling, was uniformly dull to percussion, and it was concluded that no portion of the intestine lay in front of the tumor, this striking exception to the general rule being surmised to be due to the intestine having contracted adhesion to the lower edge of the tumor in an early stage of its growth.

The hepatic dulness was not markedly increased upward, and there was no enlargement of the inguinal or other glands. The testes were unaffected.[1]

His appetite was fairly good; he had vomited frequently before admission, but only once since. The bowels were very costive, and the skin dry.

Neither at the time of his admission nor at any subsequent time was there the least appearance of œdema of the legs or feet. Pain was seldom complained of during his stay in hospital, and the tumor could always be freely handled without causing him distress.

The urine presented some characters of interest. It was usually bright and clear, very acid, sp. gr. about 1.012. It frequently deposited stringy and flaky masses, and the microscope showed numerous mucous corpuscles, and crystals of oxalate of calcium, and sometimes transparent tube-casts, of fair size, and occasionally spiral in form.

Albumen was constantly present in considerable quantity, to about one-sixth. When the clear urine was acidified with a few drops of acetic acid (or solution of tartaric acid, etc.) no immediate change occurred, but after a few seconds cloudy streaks appeared, and the opalescence gradually increased and spread through the fluid until the whole became semiopaque. This opalescence was not cleared away by a gentle heat, and was readily produced even when the urine was previously diluted to two or three volumes. It may be inferred, therefore, that the opalescence was due to the precipitation of a body of the mucin class. When the urine was simply diluted to three or four times its bulk, and allowed to stand, it became milky (globulin?).

No color change with ferric chloride. Tested for indigo substances with strong hydrochloric acid and chloride of lime, it became opaque and of a deep slate-violet color. Floated on cold hydrochloric acid, the latter assumed a violet color which was extracted by chloroform. Boiled with hydrochloric acid it became dark red. It has been already mentioned that the urine was liable to contain flaky shreds, but on December 13th, after slight difficulty in micturition and momentary obstruction, he passed a curious looking mass *per urethram.* It consisted of a filiform piece about three inches in length, terminating in a cluster of sacciform tassels. It was mostly white, but in part reddish; and was very elastic. On subsequent occasions he passed numerous other bodies of the same general character, which I preserved in spirit, but during the last few weeks of his life none were seen.

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[1] Niemeyer calls attention to the frequency with which cancer of the kidney is complicated with cancer of the testis, reminding us of the still more common coincidence of tuberculosis of these organs.

Toward the end of December the tumor had enlarged in every direction, become more prominent in front, and the cutaneous veins more distinct, especially posteriorly. Beyond the latter sign, however, there was no evidence of interference with the abdominal circulation, and the emaciated limbs were quite free from œdema. The bowels did not move except by enema; but, strangely enough, this obstinate constipation yielded after a time, and toward the end of his life the bowels acted naturally.

During the months of January, February, and March, his general condition changed but little, except that he gradually wasted to an extreme degree, his appetite slowly failed, his strength ebbed away, and he died quietly at 10 P. M., on April 14th.

The *post-mortem* examination was made twelve hours after death.

Scarcely a trace of subcutaneous fat was visible. Upon opening the abdomen, not more than an ounce or two of fluid was seen lying in the pelvis, and there were no traces of peritonitis, except a few old fleecy adhesions. Before the position of the viscera was disturbed, it was observed that *no part of the intestines lay in front* of the tumor. The colon was closely adherent to its lower edge. The liver was not displaced or twisted on its axis, an occurrence which has been often observed in other cases of renal tumor on the right side. A large vein crossed the tumor toward the left side, passing from beneath the liver to the great omentum, and a close network of veins was visible on and beneath the loose fibrous capsule which covered the tumor. In some places these veins were continuous with those of the abdominal walls. The hemorrhoidal veins were engorged. The vena cava as it passed under the liver was distended by a large laminated thrombus terminating superiorly in a blunt cone. The right renal vein was likewise occupied by a soft thrombus; the left renal vein was small and free from clot. The large intestine was contracted; the small intestines grayish colored. Mesenteric glands dark, nearly black, and very slightly enlarged.

The spleen was swollen and very soft on section. No infarcts. Liver increased in size, firm, and yielded amyloid reaction with iodine. Anterior surface of its capsule marked with fibrous reticulations.

Left kidney amyloid, scarcely enlarged. Double ureter on left side. There was no calculus in either kidney.

Bladder healthy; contained a soft quadrangular mass similar to what had been passed with the urine during life.

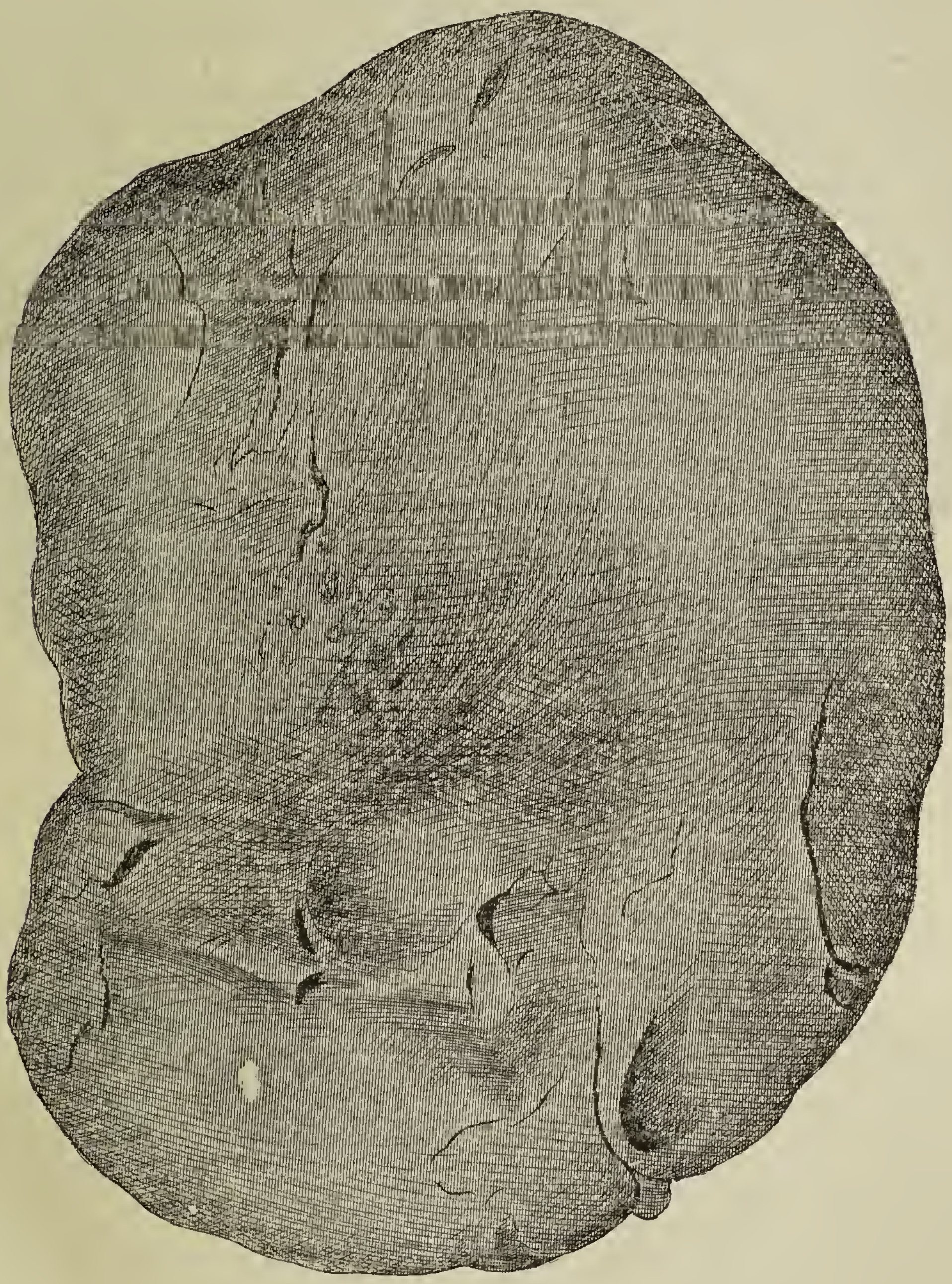
The thoracic viscera exhibited nothing noteworthy, with one exception. The heart was very small, the lungs were free from any secondary disease, but behind the trachea and between the bronchi was a group of lymphatic glands, enlarged, matted together, and infiltrated with white masses resembling malignant deposits. Subsequent microscopical examination showed that the gland tissue was simply in a state of caseous degeneration. Hence it may be said that there was no metastasis or secondary involvement of distant parts.

*Right kidney* was entirely converted into a mass of new growth. It weighed nearly four pounds. The tumor was enveloped in a sort of loose capsule of connective tissue, but was readily separated from adjacent parts. The vertebræ were not eroded.

The ureter was pervious, not dilated. The pelvis of the kidney was occupied by a firm fibrinous plug, which fitted closely and tapered down into the ureter. It was white or yellowish, elastic, and exactly resembled in appearance the clots passed *per urethram,* and when hardened and examined microscopically possessed the characters of a blood-clot.

The right suprarenal capsule was loosely attached to the summit of the tumor, and upon section exhibited a nodule or two of whitish, cheesy material. The renal tumor was divided in its length, and the cut surfaces presented a mottled appearance, traversed by intersecting bands of firm fibrous tissue, forming imperfect loculi. The greater part was of a yellowish-white color, but parts were red and stained with blood, and here and there, areas of a yellow gelatinous deposit were to be seen. Portions of the tumor were hardened for microscopical examination, and I am indebted to my friend, Dr. Henry Bewley, for mounting some slides.

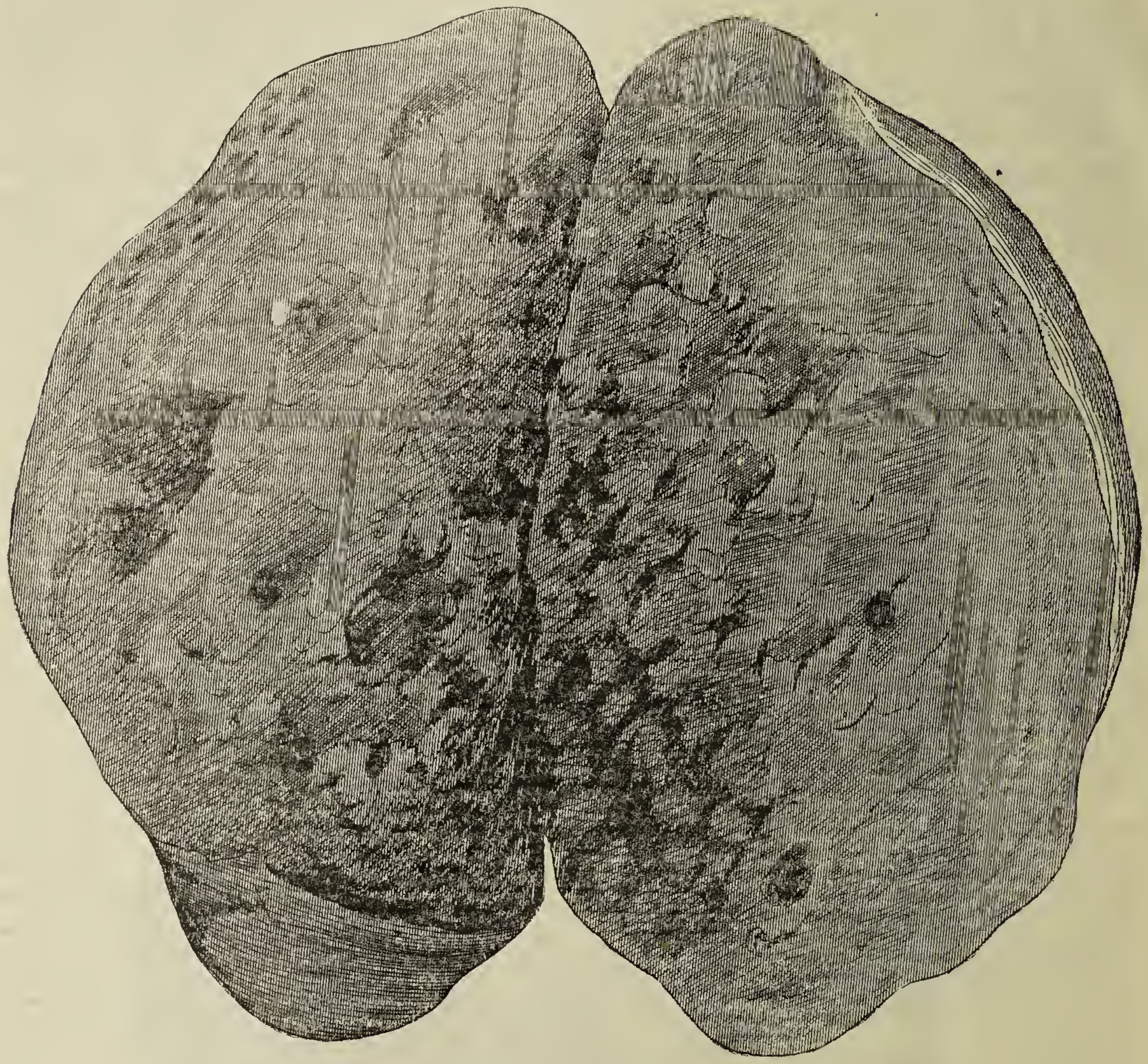
Fig. 3.



Appearance of right kidney.

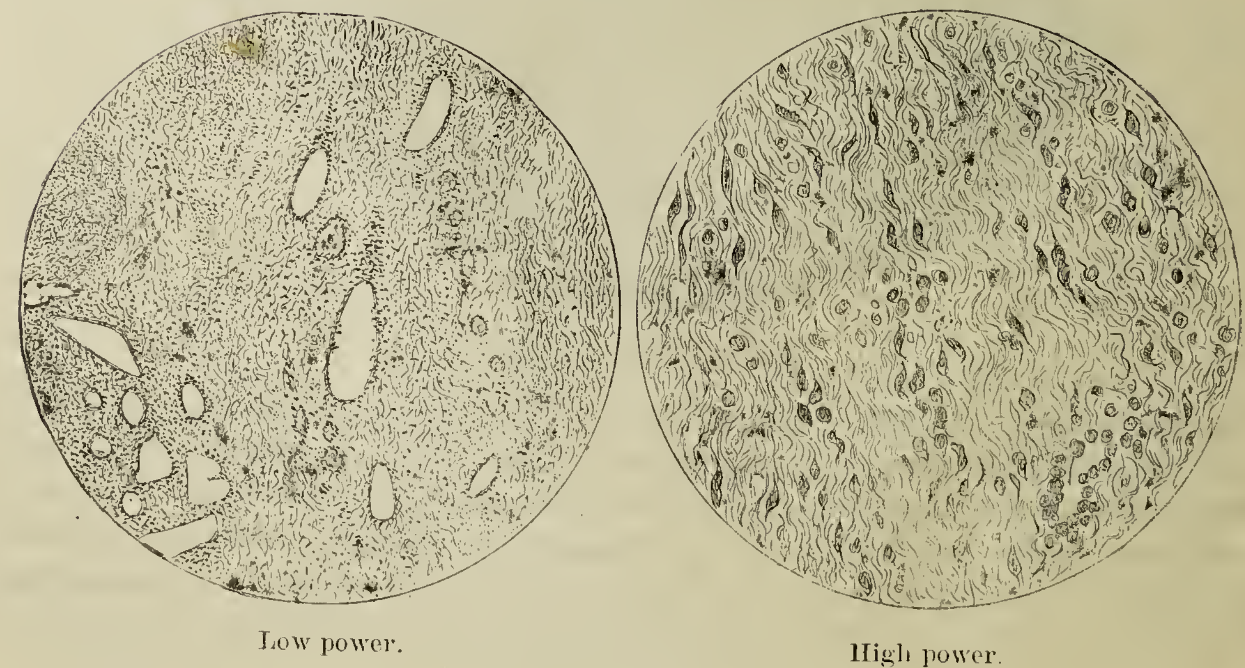
The tumor proved to be a spindle-celled sarcoma, and the appearances are fairly exhibited in the accompanying drawings.

FIG. 4.



Appearance of right kidney after incision.

FIG. 5.



Low power.

High power.

Microscopic sections of tumor.

Good illustrations of the macroscopic characters of malignant disease of the kidney are to be found in Rayer, *Traité des Maladies des Reins*, 1837, Pl. xlv. Fig. 1; Pl. xlvi. Fig. 1; and in Pl. xlvii., which depicts a thrombus in the vena cava, as in my case. Cruveilhier, *Anatomie Pathologique*, 1829, 18e Livr., Pl. 4, left kidney; 18e Livr., Pl. 1, right kidney and adrenal.

The foregoing case suggests a few remarks, and, for convenience, I shall arrange them in separate paragraphs.

1. *Rarity.* Malignant disease of the kidney appears to be of rare occurrence. In Ireland only one or two cases are alluded to in the *Transactions of the Pathological Society of Dublin*, and comparatively few are published in the *Transactions of the Pathological Society of London*. In 1877, I exhibited before the Pathological Society a specimen of a large sarcomatous tumor of the left adrenal, removed from an elderly male subject in the dissecting-room. The left kidney and all the other abdominal viscera were normal in structure.

In the Children's Hospital at Prague, Steiner observed but four cases of renal cancer among 100,000 children, although, as is well known, a notable proportion of the cases occur within the first decade of life.

2. *Diagnosis.* In my case little difficulty attended the diagnosis as to the existence of a renal tumor, the shape of which bore out Sir W. Jenner's dictum, that a diseased kidney preserves its rounded form and never acquires a sharp edge. (For a series of instructive outline diagrams of abdominal aspects of renal tumors, cf. Dickinson, *Renal and Urinary Affections*, III., 1885, p. 710.)

But it is well known that the diagnosis is not always so facile, and competent authorities lay down that swellings of the kidney are perhaps more often the subject of errors of diagnosis than those of any other abdominal organ. Two points in especial are deserving of comment in the above case:

(*a*) The absence of intestine in *front* of the tumor. Great stress is laid, and properly, upon the diagnostic value of the clinical fact that the colon almost invariably lies in front of a renal swelling, and Dickinson remarks that the exceptions are so rare that they have the interest of *lusus naturæ*. A case of Dr. Bridges is quoted by Dickinson (p. 717), in which a malignant tumor of large size of the right kidney grew in such a way that it entirely excluded the colon from any contact with the front of the tumor. The exceptions, when they occur, are more likely to be met with on the *right* side, because the colon on the right side is not so closely connected with the kidney as on the left. The colon is attached to the posterior abdominal wall higher and more extensively on the left side than on the right (cf. Landau on *Movable Kidney in Women*, New Syd. Soc., 1884). The bowel is never found in front of an enlarged spleen, and suprarenal tumors are not necessarily crossed by bowel.

(*b*) The numerous fibrinous clots which were passed at intervals for some weeks. These were mostly elongated and decolorized, and some vermiform in shape, evidently moulded in the ureter. According to Dickinson, ureteric casts are infrequent.

It may seem strange that, while these fibrinous clots were repeatedly passing out with the urine, yet no trace of blood was discovered in the urine on more than one occasion when it was looked for. The explanation appears to be this: The conical fibrinous coagulum which plugged the pelvis of the kidney and mouth of the ureter being slowly urged on from behind by the pressure of the increasing new growth, and by accretion of the clot posteriorly, bits of the plug were from time to time broken off, and so found their way to the bladder. The plug, like a tight valve, fitted the orifice of the ureter so closely, that nothing could escape past it, and hence the absence of hæmaturia. The non-occurrence, however, of hæmaturia does not count much one way or the other in a diagnostic point of view; for, taking Roberts's, Ebstein's, and Dickinson's statistics, we arrive at the conclusion that, roughly speaking, hæmaturia occurs in scarcely half the cases of malignant renal disease.

It might be asked why did not the kidney dilate, or at least cysts form, if the ureter were completely obstructed, and the reason probably was that, owing to the total destruction of the glandular renal tissue by the invading new growth, no secretion of urine occurred, the left kidney doing the entire work. Judging from the cases on record, it seems to be the exception to find the whole of the kidney tissue replaced by the neoplasm.

3. *Character of the urine.* (*a*) Albuminuria. This was persistent throughout, and varied little in amount. During the patient's lifetime it was inferred, and correctly, that this symptom betokened disease, probably non-cancerous, of the left kidney, which, it will be remembered, was afterward found to be affected with amyloid degeneration. The coincidence of malignant disease on one side, and amyloid degeneration of the other kidney, is noted by Ebstein as of very rare occurrence.

(*b*) The persistent excretion of a mucin-like substance. The urine, clear and free from viscidity, upon acidification with any acid, invariably yielded a turbidity, which gradually developed and increased in degree, and was not cleared away by cautiously warming.

4. The *absence of either ascites or œdema* of the legs is noteworthy when we consider the size, position, and weight of the tumor, and the fact of the thrombus in the vena cava, not to speak of the coexistence of amyloid disease in the other kidney.

5. *Feasibility of operation.* Metastatic deposits are stated to have occurred in seventeen out of forty-one cases collected by Dr. Bertram Windle,[1] and in the light of the post-mortem evidence I regret that the

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[1] Primary Sarcoma of the Kidney, Journal of Anatomy and Physiology, vol. xviii.

question of surgical interference was not more seriously entertained during the patient's lifetime. From the autopsy it appeared that, considering the nature and attachments of the tumor, the chance of a successful result from operation would not have been inconsiderable. A successful use of nephrectomy for round-cell sarcoma of the right kidney in a boy aged three is reported by Mr. Croft, in the *Lancet* for May 23, 1885; and in the same journal for August 15, 1885, is an unsuccessful case of operation by Mr. Whitehead for sarcoma of the right kidney in a man aged forty-six years. Death from peritonitis ensued on the fourth day. A list of cases in which the operation has been performed is given by Mr. Baker in *Trans. Med.-Chir. Society,* vols. 63 and 64.

6. *Histological nature.* It is curious to note the vagueness and diversity of statement among recent authors upon this point. Thus Roberts (*Urinary and Renal Diseases,* 4th ed., 1885, p. 575): "The species of cancer found in the kidney is almost invariably the encephaloid (fungus hematodes), and scirrhus is very rare in the kidney." Ebstein refers the majority of cases to scirrhous carcinoma; and Wilks and Moxon (1875) state that "carcinoma is the kind of cancer most commonly present in the kidney." They do not allude to sarcoma.

The fact is that scirrhus, though often spoken of, is rare as a renal growth. Malignant tumors of the kidney have been so generally described as cancer that Dickinson (loc. cit.) was much surprised to find, upon examining a number of specimens, that cancer, as structurally defined, was comparatively rare among them. "By far the larger number of malignant renal growths fall within the definition of sarcoma;" and Windle (loc. cit.) remarks that the "definitiveness of sarcoma of the kidney has only been recently recognized."

Of eight tumors catalogued as cancer in the Museum of St. George's Hospital, two of which were specified as scirrhus, six proved to be not cancer, but sarcoma; the term "scirrhus" having been applied in each instance to a hard sarcomatous growth. A profusely cellular, highly malignant, round-celled sarcoma is the most common of all renal growths (Dickinson). But the spindle-celled variety of sarcoma is also known to occur, and the case I now record is a good example of this kind of growth.

# SUCCESSFUL RESECTION OF INTESTINE IN A CASE OF STRANGULATED FEMORAL HERNIA.

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Recorded operations of this character are sufficiently rare to justify reporting the following unusual case:

F. G., a Russian Jew, æt. 68, was admitted to Mount Sinai Hospital on May 4, 1885, suffering from a strangulated hernia, and, through the kindness of Drs. W. F. Fluhrer and D. M. Stimson, visiting surgeons, I was permitted to operate on the case.

The following history was obtained: The patient has had a femoral hernia, on the right side, for the past twenty years, always reducible, and easily controlled by a truss. Three days ago, in the morning, patient went to stool without his truss, and after forcing down hernia by straining, was unable to reduce it, and soon began to suffer great pain. During this and the next day several physicians repeatedly employed taxis without relief. Three enemata were also given, which brought away a small stool. After this the patient complained of more pain, and began to vomit, at first the contents of stomach, afterwards mucus and bile. These symptoms continued through yesterday, and this morning there are in addition hiccough, and some swelling of lower abdomen. Patient has eaten nothing since emesis began, and has become very dejected and stupid.

Previous history very good. No serious illness. No venereal trouble.

*On admission:* General condition of patient is fair, though he is weak. His pulse is slow, about 70, and intermits irregularly. There is marked atheroma of arteries. Tongue is coated and dry, countenance heavy and dull. Temperature 100.4°. Patient vomits intermittently a brown offensive fluid almost fecal in odor.

In right femoral region, just below Poupart's ligament, and extending upward under same, is a roundish tense tumor about two inches in diameter, having the spine of the pubes to inner side, and the femoral artery deep behind and to outer side. The skin over this tumor is reddened, œdematous, and apparently adherent. Pressure is very painful, resonance slightly tympanitic, no fluctuation, no impulse on coughing. Lower abdomen is enlarged and tympanitic, but not tender on pressure.

*Operation* at 8 P. M. Primary ether anæsthesia was used, prolonged by the use of morphine hypodermically. Carbolic acid solution was used for cleansing the skin, and for the instruments, and solutions of bichloride of mercury for irrigation.

An incision was made over the tumor, and the sac on being opened was